

# FLIGHT

&  
The AIRCRAFT  
ENGINEER.

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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## Flight

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### EDITORIAL COMMENT.

"Newspapers are an essential part of our war organisation."—  
(Sir Auckland Geddes, Minister of National Service).



YEAR ago, when we wrote our review of 1916, it was with thoughts of Peace in our minds. All the indications then pointed to an early issue out of the world struggle which has now been running its sanguinary course for nearly three-and-a-half years. Since then a great many things have

happened. We have seen America enter the war on the side of justice and civilisation. Russia has passed through the acute throes of a complete

The Passing  
of  
1917.

dynastic and social revolution and has ceased to count as a factor in the Great War. Italy has also passed through the furnace of military disaster, and is even now not out of her trouble, fighting as she is to hold

back the irruption of the Hunnish hordes. We ourselves have had what is probably the most successful year of military operations since the outbreak of war. We have done well in the West, while in the East the tragedy of Mesopotamia has been wiped out by a series of brilliant successes which have entirely altered the aspect of the war in that distant theatre. In Palestine, too, we have done as well, and the more recent news of the capture of the Holy City may well have a decisive effect on the future of the war so far as one partner at least in the combination of the Central Powers is concerned.

And yet, in spite of all the world-shaking events of 1917—events which have probably made it historically the most important year of the war—we do not seem to be any nearer a satisfactory peace than we were twelve months ago. True, the tongue of Rumour has been busy, and there seems to be no doubt that the warring nations are feeling for an opening through which the peace that all desire can be reached. So far as this country is concerned, there is only one road to that peace. It will lead us through much greater sacrifice than we have been called upon to make in the past, but the goal is in sight and the nation steeled to a supreme effort to reach it. That it will be reached through blood and tears we doubt not. Indeed, it *must and shall* be reached, whether in 1918 or in some later year. We want peace, but there are other things that count for more just now, and until these have been attained there can be no thought of peace in our minds. Nevertheless, we can hope that the coming year will be the year of Victory and Peace—victory complete and overwhelming, and a peace that will make war between the great nations of the earth for ever impossible.

#### The British Air Services.

At the end of last year we were able to record that wonderful progress had been made in the course of 1916 in the development of the British Air Services. The year which is just drawing to its end has been, in many ways, a more remarkable one still. A year ago we were constrained to say that progress in the Services had been of the steady routine kind imposed by the increasing needs of the war. There had been no changes in the high commands to chronicle; no dramatic reorganisations to be recorded. In a word, progress had been made in



Cinderella of the Navy to official acknowledgment of its immense importance as an integral part of our military scheme. In explanation it may be said that its importance had really been recognised a long time prior to this, but Commodore Paine's appointment was taken to be the outward and visible sign of inward grace, as it were.

About the middle of the year there were persistent reports afloat to the effect that Lord Cowdray intended to resign and that Lord Northcliffe was to replace him. At the time these rumours were denied, but in the light of subsequent events it seems probable that there was fire to account for the smoke. However, Lord Cowdray remained at his post until after the introduction of the Bill for combining the R.N.A.S. and the R.F.C. into a separate Service, to be called the Air Force, when he vacated the position of President of the Air Board and was succeeded by Lord Rothermere as Secretary of State for Air. At about the same time, General Henderson, who for long had been in command of the R.F.C. as Director-General of Military Aeronautics, retired from that appointment and gave place to General Salmond.

During the whole of the year, as for a long time previously, "FLIGHT" had been a consistent advocate of an Air Service, separate and distinct from both Navy and Army, having its own corporate existence, its own uniform, and its own badge, with a real Air Board similar in constitution to the Board of Admiralty and presided over by a Secretary of State. Quite late in the year, the Government introduced the Air Force Bill, the effect of which was to create such a Service, and this Bill became law with very little opposition in either Upper or Lower House. We have still to wait for its provisions to be given full effect, inasmuch as the Air Force Act is what is known as an "enabling" Act and requires an Order by the King in Council to make its provisions active. That the interval will be a short one we do not doubt, especially as during the closing days of the year the Air Minister stated categorically that a great deal of progress had been made with the details, and it was hoped that the requisite Order would be issued very shortly. As a matter of fact, it is no secret that a good deal of active work has already been done towards rendering the combination of the two Services effective, so that the Order when it is issued will, for the time being, merely legalise, as it were, an already existing state of things.

#### New Aircraft Types.

Before the war it was our custom to glance briefly at the new types of aircraft evolved during the year. Now, however, we are precluded from making any but the barest mention of our own new designs, and although we have by courtesy of the authorities been able from time to time to print the constructional details of captured enemy machines, no review of progress can be held complete unless it is truly comparative. But this may with justice be said, that the end of 1917 sees the British Air Force equipped with machines which, type for type, are probably in advance of those of the Germans, and, for the time being at least, greater in number. We say advisedly for the time being, because we are not altogether satisfied that our own efforts to speed up construction, great as they undoubtedly have been, will suffice to keep pace with those being exerted by Germany in anticipation of the fighting of the spring

of next year. We, naturally, trust that our position of supremacy will remain unchallenged. Indeed, we believe it will, but there is just enough of the element of doubt in the case to give rise to a feeling of disquietude. The assistance of America will, of course, be more than sufficient to redress any balance against us, but what we have to keep in mind is that there is just the possibility of Germany being ready for a great air offensive before America begins to make her weight felt, and we cannot, consequently, afford to take any chances at all. What we have to do is to go on as though we had to depend upon our own unaided efforts—nothing less than that will give us absolute safety.

#### The Dirigible.

After the scant success which attended the enemy's attacks on British towns during 1916 and his heavy losses in Zeppelins, we had thought he would have held the game to be not worth the candle. However, the record of the year shows that Germany has still not lost faith in the airship as an offensive weapon. Still, she must have been driven farther along the road to a shattering of her belief in the great gas-bag that was to play so great a part in giving her the dominion of the world. So far as the available information leads us to believe, very little has been done in Germany towards the further development of the dirigible. True, we have had at various times quite circumstantial stories of great new super-Zeppelins building at Friedrichshafen, but these have come through the usual neutral channels which, as a rule, are worse than simply unreliable.

Here in England the record has been one of progress. It is not permissible to discuss matters in detail, but as it is not a month ago that a British airship of the Zeppelin type flew over the Metropolis, it may without any fear of giving useful information to the enemy be said that we have at least one modern airship of the rigid type in active commission. As to what else has been done in the direction of developing our dirigible strength we cannot speak.

No reference to dirigibles would be complete without mention of the death of Count Zeppelin, which occurred in March. At the time, we said what was in our minds and, on the principle of *de mortuis nil nisi bonum*—even in the case of a Hun—we will add nothing thereto.

#### Raids—Enemy and Allied.

At this time last year we gave a summary of the raids, enemy and Allied, which had characterised the twelve months of 1916. During the year which is now approaching its end the war in the air has reached such a pitch of intensity that it is almost hopeless to attempt to chronicle even the matters of importance. Scarcely a day has passed without its record of raids, accomplished or attempted, by one side or the other. A year ago we should have hesitated to pronounce that the aerial war might conceivably be decisive of the whole world struggle, but so great has been the growth in 1917 that not only have we no hesitation in regarding the air as the decisive fighting sphere, but it is possible to say that this is the fixed opinion of every military authority.

It is possible, however, to glance briefly at a few of the salient occurrences of the year. It was not



until June that the enemy made any serious attempt to raid our shores. This took the shape of an attack in some force on Folkestone, in which a considerable amount of material damage was done and a number of civilians, including many women and children, were killed and injured. Not many days later London was surprised by an attack in the middle of a summer forenoon, which was carried out by some twenty enemy machines and in which some amount of damage and loss of life was caused. It was this raid which really set going the insistent demand for reprisals, a demand which up to the present has not been met, although the country has been fed with promises of "giving the Germans all sorts of unpleasant things." However, now that we have a strong man as Air Minister, it is possible to hope that we shall at long last really begin to hit the enemy where it will hurt him most. Later in the month, German aeroplanes made another heavy attack on the Thames Estuary, but on this occasion they were met by our anti-aircraft defences and driven back into the arms of the Dover and Dunkirk patrols and lost ten machines.

After this we had a comparatively quiet time until August, when another attack in force was made on the Kent coast. It was during this raid that clearly marked hospital buildings at Margate were deliberately bombed and another chapter of infamy added to the already heavy amount of the brutalised Hun. In the following month of September London was again attacked on three occasions, but the excellence of the defences prevented the attack from being pressed home, and comparatively little damage was caused. There was the usual loss of civilian life, but thanks to the adequacy of the warning given and the efficiency of the defence, the casualties were quite surprisingly light. In October London was again raided, this time by a fleet of Zeppelins. So far as it was possible to learn, only one airship succeeded in getting through the defences. Bombs were dropped in several districts, causing but small damage to property and but little loss of life. The enemy's experience on this occasion certainly ought to deter him from future long distance airship raids, since owing to a fortunate combination of circumstances the raiding fleet was compelled to fly very low over France in returning. Four were actually brought down by the French defences, one being captured absolutely intact, and three or four others were almost certainly destroyed in other ways. That is, of eleven airships that set out to raid Britain, not more than three, or at most four, regained their base. Since then the Zeppelin has visited England again, in spite of the lesson, but this time the attempt was a very tentative affair and the hostile airships did not even try to penetrate inland. Early in the present month London again suffered from the visitation of German aeroplanes, this time in the very early morning. Three or four machines managed to get through the outer defences of the Metropolis and dropped bombs in certain quarters, again causing small damage to life and property.

On the side of the Allies there has been a great deal of raiding activity, which, however, has been mainly confined to the attack of points of direct military importance. Ostend and Zeebrugge have been consistently and continuously bombarded from the air. The docks at Bruges and the enemy aerodromes in Belgium have also been many times attacked from the air, with excellent effect. The aerial war, however, has not been taken into Germany

to any extent. Freiburg has been attacked once or twice, and raids have been carried out on towns in Alsace in which enemy munition factories are situated, while the blast furnaces in the same districts have also received a fair amount of attention. But of raids on the Rhineland cities—the only process of war which is likely to be deterrent of raids on our own open towns—there have been none. However, as we have said before, it may now be hoped that the intention does seriously exist to take the war into Germany in real earnest and that the intention may very shortly be translated into deeds.

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#### The Roll of Honour.

Again at the close of another year we have to deplore the loss of a very large number of gallant officers and men of the Flying Services. The tremendous growth of the Services and the bitter intensity of the fighting in the air have had, as their natural and inevitable result, a correspondingly large increase in the numbers of casualties. Still, there is this to be said, that having regard to the far greater amount of flying entailed by the necessities of war, the average of casualties has been again proportionately lighter than it was in 1916. And it is more than satisfactory to be able to record that, in spite of the undoubted dangers of war flying and the consequent toll of human life, there is not, and never has been, the slightest difficulty in getting more than sufficient new entries to make good wastage and to allow for the expansion of the service. On the contrary, the difficulty has not been to secure enough offers of service in the R.F.C. and R.N.A.S., but to make a selection of the most suitable from among the huge numbers of candidates anxious to fly.

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#### The Royal Aero Club.

Early in the year the Club removed from its former inconvenient premises to a far better location in Clifford Street. The added social attractions which the removal has enabled the Club to offer has brought it a substantial influx of new members, and it is in a fair way of becoming one of the most important clubs in London, apart altogether from its unique position as the representative of British aviation. During the year, of course, the Club, so far as concerns its principal function as the governor of matters aerial, has been in a state of suspended animation, and must remain so until the war is over.

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#### Industrial Trouble and Output.

Unfortunately, it has to be chronicled that the output of aircraft has been retarded to quite a serious extent by strikes and unrest among certain classes of workers. There are two sides to every question. On the one hand, there is the enormously enhanced cost of living, which certainly justifies the workers in demanding at least enough to live their lives in reasonable comfort. Again, on the side of the workers, it is undoubted that there is a class of employer which is not prepared, except under pressure, to concede even common justice to his workers. Add to this that the official handling of trade disputes has almost invariably been conspicuous for weakness and want of tact, so that altogether it is hardly surprising that industrial unrest should exist in the country. But on the other hand, we have been quite unable to discern in



any of the strikes directly affecting the output of aircraft the slightest reason or justification on the part of the workers for "downing tools" and holding up the production of essential aeroplanes and aeroplane parts. Let us hope that the New Year will see a new order of things, in which everyone concerned—employers, workers, and officials—will approach matters from the one point of view, that of winning the war in the shortest possible period of time. If they will all do that, then there need be no more stoppages of work, with all the deplorable, nay criminal, consequences these strikes and upheavals bring in their train.

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## Technical Progress.

From a technical point of view the progress made during 1917 may be briefly summarised in three words: increase in size. This applies especially to the subject of engines, but also, although to a lesser extent, to the aeroplanes themselves. The cause of this is easily traced. Constantly the cry is for better, and still better, performance. By this we mean higher speed, greater rate of climb and higher "ceiling," and greater reliability. No sooner has one side produced a certain type of machine which is a little bit better than anything the other side has in use, than efforts are immediately made to go one better still, and so the race for supremacy—technically speaking—goes on continually. In improving the performance of an aeroplane there are two distinct courses that may be followed. One consists in lightening a given machine to as large extent as is compatible with a requisite factor of safety, and reducing the parasite resistance to a minimum, while at the same time endeavouring to devise wing sections of greater efficiency. This line of progress—as far as it goes—is good in as far as it enables the types of engines already in existence to be used, which is obviously an advantage from a production point of view. On the other hand, so far as our knowledge of the science indicates, the limits of improvement with this method are reached comparatively soon, and for any further improvement one is obliged to turn to other ways and means. This is actually what happens in the case of the second course of development referred to above, and consists in putting into use engines of higher power and, unfortunately, also of greater weight. The mere piling on of power does not, of course, necessarily mean a very greatly increased performance, for the simple reason that the higher power is accompanied by greater engine weight, and it is only by the careful proportioning of the power to percentage engine weight and other weights that the increased performance is obtained. That it is obtained is, however, evident, and probably one of the chief contributory causes of this is that the landing speeds increase as the experience of pilots permit. If it were not for this fact, and one had to adhere to the comparatively low landing speeds of earlier days, it is doubtful whether the extra power of the newer engines would result in any very material gain as regards the top speeds.

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## Engine Development.

To come down to actual figures of engine powers. For obvious reasons any reference made to this must of necessity be somewhat guarded at a time like the present, but it may be permissible to point out that whereas during the latter part of

1916 and the earlier part of this year engines of anything from 130 h.p. to 200 h.p. were the power plants usually called for, according to the particular type of machine, such powers would at the present day be regarded totally inadequate for most purposes, and the 200 h.p. of last year is now almost the minimum for this year, while the maximum power now called for is at least 350 h.p. nominally, and there is every reason to believe that this figure will soon be a thing of the past. In the camp of the enemy the power has gone up from that of the 160 h.p. Mercedes and Benz to the now very extensively employed 260 h.p. Mercedes and 230 h.p. Benz. While development of the higher powered engines has, with the Allies, generally speaking, taken the form of Vee type water-cooled engines, the Germans have adhered to what may, perhaps, be referred to as their first love, the six-cylinder vertical type. As to who is right, or whether there is much to choose between the two forms, this is a subject which we are again naturally debarred from discussing. Suffice it to state the bare fact.

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In the matter of the aeroplanes themselves the year just concluding would appear to have been chiefly notable on account of the general growth in size, which generally speaking applies to all the various types of machines in use. The little fast single-seater fighter has grown to proportions somewhere between last year's two seaters and the previous single-seaters. This is principally due to the fitting of a larger water-cooled engine, which not only takes up more room and calls for a deeper and altogether more roomy fuselage, but which also is very considerably heavier and therefore requires a somewhat greater wing area in order to keep the landing speed within reasonable limits. As a type this machine has not changed very much. One finds the synchronised machine gun and in some cases, although by no means invariably, an additional gun capable of being swivelled. Altogether there seems to be, as regards the single-seater fighter, a tendency to increase the armament from one synchronised gun to two, and to carry in addition one or more guns that may be fired in directions other than straight forward.

The two-seater fighter or reconnaissance type has not undergone any radical changes beyond the increase in engine power which appears to be common to all types. It has now become, practically speaking, universal practice, both with the Allies and among our enemies, to place the pilot in the front cockpit and to arm him with two synchronised guns, the gunner being placed in the aft seat and armed with a gun on a turn-table enabling him to fire in all the directions left free by various parts of his own machine.

Probably of all the types in use the one that has come to be taken up and developed to the greatest extent is the twin-engine machine. It is met with extensively in all the belligerent countries, and it may safely be stated that the large twin-engined machine has come to stay, not only for purposes of war but equally certainly for commercial flying after the war.

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The same tendency towards larger dimensions noticeable in land machines is evident in the development of the seaplanes of the different nations. We in this country, although probably possessing and employing a greater variety of types than any other of the warring countries, have made a special—and let it be stated



at once without fear of contradiction—successful, study of the large seaplane of the flying boat type, which has rendered such signal service in connection with the U-boat campaign. The enemy, as in many other aeronautical matters, has remained somewhat conservative and has adhered closely to the tractor twin-float seaplane, with occasionally a flying boat thrown in, more especially as regards Austria. In the matter of large sea-going aircraft the Germans have not, as far as one is able to ascertain, made any particular effort at development, relying, it must be assumed, on his lighter-than-air craft for sea scouting and other purposes for which we employ the large seaplane. A discussion of the pros and cons of the two types is not permissible, tempting as it is to contemplate.

Although, speaking with reference to **Airships**, this country, our airship service is probably the branch which has been accorded least publicity, it does not by any means

follow, and should on no account be assumed, that it has not done work of the most important and fruitful kind. As regards the technical progress of the various airships little may be said, but it has not been so small as some are inclined to think, and when the time comes when one may speak more freely of these things it will be found that if we have not at this moment got huge fleets of rigid airships of the Zeppelin type, it does not necessarily follow that this is a sign of inability to produce craft of that particular type. Each country is working under certain conditions, geographical and otherwise, and what is suitable for one nation is not necessarily of as great advantage to another. In the matter of the smaller type of non-rigids used for coast patrol and sea scouting we have done and are doing well, and we may safely assume that those responsible know what is wanted and how to get it, and that the shouting by those who are not and cannot be in possession of sufficient facts to form a true opinion, is only calculated to hinder and irritate those who are doing their level best to deal with each problem as it comes along.

## HONOURS.

### Honours for the R.N.A.S.

It was announced on December 19th that the King has been pleased to approve of the award of the following honours, decorations, and medals to officers and men for services in action with enemy submarines:—

#### *Distinguished Service Cross.*

Flight Sub-Lieut. (now Flight Lieut.) N. A. Magor, R.N.A.S.; Flight Sub-Lieut. R. Jarman, R.N.A.S.

#### *Bar to the D.S.C.*

Flight Lieut. E. J. Cuckney, D.S.C., R.N.A.S.

#### *Second Bar to the D.S.C.*

Flight Comdr. T. D. Hallam, D.S.C., R.N.A.S.

#### *Distinguished Service Medal.*

Acting Air Mech., 1st Grade, E. H. Clarke, O.N. F17921.

The following officers and men have been mentioned in dispatches:—

Flight Lieut. B. D. Hobbs, D.S.O., D.S.C., R.N.A.S.; Flight Lieut. J. L. Gordon, R.N.A.S.; Flight Sub-Lieut. (now Flight Lieut.) R. F. L. Dickey, D.S.C., R.N.A.S.; Flight Sub-Lieut. C. J. Clayton, R.N.A.S.; Observer Sub-Lieut. K. G. Coles, R.N.A.S.

Leading Mech. S. F. Anderson, D.S.M., O.N. F12676; Air-Mech., 2nd Grade, H. M. Davies, D.S.M., O.N. F20254.

The King has been pleased to approve of the award of the following decorations and medals to officers and men of the Royal Naval Air Service:—

#### *Distinguished Service Cross.*

Flight Lieut. R. G. Gardner, R.N.A.S.—In recognition of the great zeal and gallantry displayed by him on the night of October 15th, when a bombing raid was carried out on Bruges Docks and good results obtained in spite of heavy and accurate anti-aircraft fire. This officer has taken part in 36 bombing raids.

Flight Lieut. J. W. Alcock, R.N.A.S. (now prisoner).—For the great skill, judgment, and dash displayed by him off Mudros on September 30th, in a successful attack on three enemy seaplanes, two of which were brought down in the sea.

Flight Sub-Lieut. (now Flight Lieut.) C. F. M. Chambers, R.N.A.S.—During the combined naval and military operations in the neighbourhood of Lindi, East Africa, on June 10th and 11th, this officer flew his machine at all hours of the day under heavy fire with excellent results, bringing back to his commanding officer clear and concise reports.

Flight Sub-Lieut. (acting Flight Lieut.) W. A. Curtis, R.N.A.S.—For conspicuous gallantry and devotion to duty. He has on many occasions destroyed and driven down out of control enemy machines. On October 21, in a combined attack with two other pilots, he sent down an enemy machine in flames, and 20 minutes later he followed another enemy scout from 10,000 to 2,000 feet, and sent it down in a vertical dive, which ended in a crash.

Observer Lieut. C. Chapman, R.N.A.S.—In recognition of the great gallantry and skill displayed by him on October 18th, when he carried out a photographic reconnaissance

in spite of adverse conditions and intense cold, as a result of which he was severely frostbitten. He has repeatedly carried out valuable photographic reconnaissances at long distances behind the enemy lines under very heavy and extremely accurate anti-aircraft fire and despite the tactics of enemy aircraft.

Flight Sub-Lieut. C. R. Lupton, R.N.A.S., Flight Sub-Lieut. E. Dickson, R.N.A.S., and Observer Sub-Lieut. W. L. Hill, R.N.A.S.—For conspicuous gallantry and devotion to duty in a bombing raid on Thourout Railway Station and Varsennaere Aerodrome on October 25th. These officers volunteered for the expedition in spite of extremely unfavourable weather conditions. They have all previously taken part in many bombing raids.

Flight Sub-Lieut. J. G. Manuel, R.N.A.S.—For conspicuous gallantry and devotion to duty in air fights and bombing raids, particularly on September 26th, when he attacked alone the Abeele Aerodrome, dropping his bombs from about 1,500 feet, with good results. A machine gun then opened fire on him, but he dived down low and silenced it by firing 50 rounds from his machine gun.

Observer Sub-Lieut. T. Terrell, R.N.A.S.—For conspicuous gallantry and devotion to duty in a long-distance bombing raid on October 28th, when a direct hit was obtained on a munitions factory. He was heavily attacked by machine-gun fire on his homeward journey which was carried out under exceedingly trying conditions. He has also carried out other bombing raids and a number of photographic reconnaissances.

#### *Bar to the D.S.C.*

Flight Lieut. (Acting Flight Comdr.) J. S. T. Fall, D.S.C., R.N.A.S.—In recognition of the conspicuous courage displayed by him in attacking enemy aircraft in superior numbers on many occasions. On October 15th he attacked an enemy machine from in front at very close range, at times within 25 yards. He then turned sharply and attacked from behind, sending the enemy machine down spinning on its back and emitting great volumes of black smoke.

Flight Lieut. H. T. Mellings, D.S.C., R.N.A.S.—For the great skill, judgment, and dash displayed by him off Mudros on September 30th, 1917, in a successful attack on three enemy seaplanes, two of which were brought down in the sea.

#### *Second Bar to the D.S.C.*

Flight Lieut. (Acting Flight Comdr.) J. S. T. Fall, D.S.C., R.N.A.S.—In recognition of his services on November 12th and 13th, 1917, when he had successful engagements with three enemy machines. He has always shown great courage and gallantry in the face of the enemy and maintained a high record of achievement, having destroyed many enemy machines.

#### *Distinguished Service Medal.*

Leading Mech. S. H. Pinchen, O.N. F2932; Acting Air-Mech., 1st Grade, G. Smith, O.N. F4430.

The following officer has been mentioned in dispatches:—

Flight Sub-Lieut. (now Flight Lieut.) P. K. Fowler, R.N.A.S.



### Gallantry of R.N.A.S. Pilot.

THE following appeared in the *London Gazette* of December 18th :—

The King has been pleased to confer the Albert Medal on Flight Lieutenant EDWARD PEVERALL MEGGS DAVIS, R.N.A.S. The following is the account of the services in respect of which the decoration has been conferred :—

On October 3rd, 1917, whilst carrying out a practice flight, a seaplane, piloted by Flight Sub-Lieutenant James Douglas Grant, fell into the sea. The seaplane turned over and the pilot was enclosed in the boat under water. Flight Lieutenant Edward Peverall Meggs Davis immediately flew a seaplane to the position of the accident, made fast to the wreck, and dived under the wreck in his uniform and endeavoured to extricate Flight Sub-Lieutenant Grant.

To do this it was necessary for him to dive amongst, and struggle through, the mass of wires and broken parts of the wreck. Notwithstanding the imminent danger of being caught up amongst them, Lieutenant Davis continued his efforts to get Flight Sub-Lieutenant Grant out until the emergency boat arrived on the scene. No other help was at hand until the arrival of this motor-boat, which at the time of the accident was about a mile and a half away.

Flight Lieutenant Davis risked his life in endeavouring to save that of his brother officer, as there was every chance of his becoming caught under water in the wires of the wreck.

### Honours for the R.F.C.

It was announced in the *London Gazette* of December 17th that the King has been pleased to confer the following rewards for gallantry and distinguished service in the Field. The acts of gallantry for which the decorations have been awarded will be announced as early as practicable :—

#### *Distinguished Service Order.*

2nd Lieut. R. C. STEELE, R.F.C., S.R., Egypt.

#### *Bar to the M.C.*

Temp. 2nd Lieut. M. B. FREW, M.C., Gen. List and R.F.C. (M.C. gazetted October 18th, 1917.)

Lieut. R. A. MAYBERY, M.C., Lrs. and R.F.C. (M.C. gazetted September 26th, 1917.)

2nd Lieut. M. A. POWELL, M.C., Gen. List and R.F.C. (M.C. gazetted September 26th, 1917.)

#### *Military Cross.*

Lieut. (temp. Capt.) J. M. BURD, R.F.A. and R.F.C.

Lieut. E. W. CLARKE, R.F.C., Spec. Res.

Temp. 2nd Lieut. W. DURRANT, Gen. List and R.F.C.

Temp. Capt. H. O. W. HILL, R.F.C.

2nd Lieut. D. A. F. HILTON, R.F.C.

2nd Lieut. H. H. MADDOCKS, Gen. List and R.F.C.

Capt. J. J. L. WILLIAMS, Yeo. attd. R.F.C. (Egypt).

The King has been pleased to approve of the award of the Military Medal for bravery in the Field to the following :—

88288 Sergt. W. J. Benger, R.F.C.; 45211 1st Air-Mech. C. S. Britten, R.F.C., attd. R.G.A.; 10500 1st Air-Mech. W. Morgan, R.F.C.; 78563 1st Air Mech. A. G. J. Whitehouse, R.F.C.

The King has been pleased to approve of the award of the Meritorious Service Medal to the following, for gallantry in the performance of military duty :—

2546 Sergt. W. F. Parke, R.F.C.

The King has been pleased to approve of the award of the Meritorious Service Medal to the following in recognition of valuable services rendered with the Armies in the Field during the present war :—

1655 Sergt. (Acting Flight-Sergt.) F. F. W. Darke, R.F.C.; 7677 Flight Sergt. (temp. Sergt.-Major) L. R. Fears, R.F.C.; 1267 Sergt. R. J. H. Holland, R.F.C.; 4384 Sergt. G. E. J. Horwood, R.F.C.; 12128 Sergt. (acting Flight-Sergt.) J. W. Lange, R.F.C.; 2021 Sergt. A. Leslie, R.F.C.; 3396 Sergt. (acting Flight-Sergt.) H. H. Medlam, R.F.C.; 5775 Sergt. Major H. W. Prickett, R.F.C.; 662 Flight-Sergt. W. Simpson, R.F.C.; 11778 Flight-Sergt. W. Swinburn, R.F.C.; A296 Sergt. L. Horscroft, Aus. F.C.; A332 Flight-Sergt. H. Johnston, Aus. F.C.; A105 Flight-Sergt. R. S. Robertson, Aus. F.C.

### French Honours for the Air Services.

It was announced on December 19th that the following decorations have been presented by the President of the French Republic for distinguished services rendered during the course of the campaign :—

#### *Croix de Guerre.*

Flight Lieut. B. A. Smart, D.S.O., R.N.A.S.; Leading Mech. H. Simpson, D.S.M., O.N. F.2647; Lieut. (temp. Capt.) W. L. Birch, W. Yorks R. and R.F.C.; 2nd Lieut. (temp. Lieut.) J. H. Broadway, Dorset R. and R.F.C.; 2nd Lieut. D. A. Glen, late R.F.C.; temp. 2nd Lieut. H. A. Jones,

Wilts R. and R.F.C.; 2nd Lieut. (temp. Lieut.) J. W. D. Leigh, Nthn. Cyclist Bn. and R.F.C.; 2nd Lieut. (temp. Lieut.) F. W. H. Thomas, Staffs Yeo. and R.F.C.; temp. Capt. Sir D. J. Wernher, Bt., A.S.C., attd. R.F.C.

#### *Legion d'Honneur.*

##### *Croix d'Officier.*

Capt. H. D. Briggs, R.N. (Wing Capt. R.N.A.S.); Major (temp. Brig.-Gen.) J. H. W. Becke, D.S.O., Notts and Derby R.; temp. Lieut.-Col. the Hon. A. S. Byng, Gen. List and R.F.C.

##### *Croix de Chevalier.*

Capt. I. P. R. Napier, Argyll and Suth'd Highrs., and R.F.C.

### Medals for Brave Nurses.

It was also announced on December 18th that the King had been pleased to confer the Military Medal for Bravery in the Field on the following ladies of the Nursing Service for bravery and conspicuous devotion in the performance of their duties whilst exposed to enemy shell fire or bombs dropped by the enemy aircraft :—

Miss Elizabeth Mountford Humphries, Matron, T.F.N.S.; Miss Gladys Victoria King, Queen Alexandra Hospital (V.A.D.); Miss Helena Kate Repton, Queen Alexandra Hospital, B.R.C.S.; Miss Ethel Isabella Devenish Meares, Sister, Q.A.I.M.N.S. (R.); Miss Annie Weir, Nurse, B.R.C.S. (V.A.D.); Miss Lelia Helen Ann Thomson, Sister, T.F.N.S.; Miss Annie Alexander, Nursing Sister, Queen Alexandra Hospital, B.R.C.S.

### Awards for Anti-Aircraft Services.

It was announced in the *London Gazette* of December 18th that the King has been pleased to confer the following awards in recognition of gallantry and distinguished service in connection with Anti-Aircraft services in the United Kingdom :—

#### *Bar to the D.S.O.*

Temp. Capt. G. W. M. Green, D.S.O., M.C., General List, R.F.C.

#### *Distinguished Service Order.*

Lieut.-Col. W. M. Thompson, R.E.; Temp. Capt. W. H. Haynes, R.F.C.

#### *The Military Cross.*

2nd Lieut. F. A. D. Grace, S.R., R.F.C.; Temp. 2nd Lieut. G. Murray, General List, R.F.C.; Temp. 2nd Lieut. T. B. Pritchard, late General List and R.F.C.

#### *The Military Medal.*

No. 564555 Sapper R. E. Fraser, R.E.; No. 23555 Fitter J. Horner, R.G.A.

### Mentioned for A.A. Services.

It was announced in the *London Gazette* of December 20th that the names of the following have been brought to notice in dispatches for valuable services rendered in connection with anti-aircraft services in the United Kingdom :—

Bt.-Col. (Temp. Maj.-Gen.) E. B. Ashmore, C.M.G., M.V.O., R.A.; 2nd Lieut. C. C. Banks, R.W. Fus. and R.F.C.; Capt. E. Barraclough, R.G.A.; 2nd Lieut. (Temp. Capt.) D. J. Bell, M.C., R.F.C. (S.R.); 2nd Lieut. S. Bishop, R.G.A. (S.R.); Temp. Lieut. (Actg. Capt.) G. H. Boreham, R.G.A.; Lieut. (Temp. Capt.) C. J. G. Brand, M.C., R.F.C. (S.R.); Lieut. A. H. Breeds, R.G.A. (S.R.); Lieut. (Actg. Maj.) W. B. Brittain, R.G.A.; Capt. (Actg. Lieut.-Col.) C. Buckle, R.G.A.; Lieut. C. J. Chabot, R.F.C. (S.R.); Capt. (Actg. Lieut.-Col.) W. E. Dittman, R.G.A.; Lieut. (Temp. Capt.) P. E. B. Fooks, R.G.A.; Maj. E. J. Goldsmith, R.G.A.; Temp. Capt. G. W. M. Green, D.S.O., M.C., Gen. List and R.F.C.; Major (Temp. Lieut.-Col.) G. M. A. Gregory, R.F.A.; Major (Temp. Lieut.-Col.) Y. C. G. A. Hankey, R.F.A., R. of O.; Lieut. (Actg. Capt.) H. I. Hardy, R.G.A.; Capt. (Temp. Major) W. B. Hargrave, Suff. R. and R.F.C.; 2nd Lieut. G. H. Harrison, Midd'x R. and R.F.C.; Temp. Capt. W. H. Haynes, R.F.C.; Temp. Capt. (Temp. Lieut.-Col.) F. R. Hedges, Gen. List and R.F.C.; Lieut. (Actg. Capt.) W. H. Hinton, R.F.A.; Major (Actg. Lieut.-Col.) W. G. Lucas, R.G.A.; Capt. W. H. Mather, R.E.; Lieut. (Temp. Capt.) R. C. Moore, R.G.A.; Lieut. H. A. Newton, R.G.A.; Temp. 2nd Lieut. M. Nicholson, R.F.C.; Capt. F. G. Orr, R.F.A.; 2nd Lieut. (Temp. Capt.) S. Pratt, R. Fus. (S.R.) and R.F.C.; Lieut.-Col. A. Rawlinson, C.M.G., R.G.A.; Lieut. (Temp. Capt.) C. A. Ridley, D.S.O., M.C., R. Fus. and R.F.C.; Lieut. (Temp. Capt.) C. Sutton, R.F.C. (S.R.); Lieut.-Col. W. M. Thompson, R.E.; Capt. (Temp. Major) A. A. B. Thomson, M.C., R. War. R. and R.F.C.; Capt. (Temp. Lieut.-Col.) A. T. Watson, R.F.C. (S.R.); Major (Actg. Lieut.-Col.) Sir A. W. White, Bt., R.H.A.

L.-Cpl. (Actg. Staff Sgt. Mech.) E. G. Anness, No. 562665, R.E.; Sgt. W. E. Archer, No. 65434, R.G.A.; Sgt. A. Arthur, No. 277960, R.G.A.; Actg. Sgt. H. E. Askew, No. 119348, R.G.A.; Flt. Sgt. R. Baker, No. 873, R.F.C.; Cpl. M. Bald-



win, No. 168392, R.G.A.; Actg. Bty. Qrmr.-Sgt. A. H. Ballard, No. 145949, R.G.A.; Gnr. W. P. Barber, No. 119199, R.G.A.; Actg. Bombr. B. T. Beaumont, No. 132110, R.G.A.; Gnr. (Actg. Sgt.) F. H. Beavis, No. 121940, R.G.A.; Cpl. (Actg. Sgt.) T. R. Beecham, No. 149103, R.G.A.; Cpl. (Actg. Sgt.) S. Birchall, No. 562637, R.E.; Cpl. (Actg. Sgt.) J. H. Blackman, No. 128503, R.G.A.; Mech. Staff-Sgt. T. M. Brand, No. 465401, R.E.; Sgt. H. E. Breething, No. 540443, R.E.; Sgt. C. H. Buckle, No. 23308, R.F.C.; Actg. Sgt. J. A. Busbridge, No. 157729, R.G.A.; Cpl. (Actg. Staff Sgt.) T. W. C. Bush, No. 530076, R.E.; Temp. Sgt.-Maj. P. M. Calder, No. 8397, R.F.C.; 2nd Cpl. (Actg. Sgt.) A. Carpenter, No. 540079, R.E.; Sgt. W. Clay, No. 118834, R.G.A.; Temp. Sgt.-Maj. W. D. Cormack, No. 683, R.F.C.; Actg. Sgt. A. F. Davies, No. 92764, R.G.A.; Gnr. R. J. Day, No. 70918, R.G.A.; Sgt. C. F. Dodd, No. 27663, R.G.A.; Actg. Bombr. H. Easdown, No. 128479, R.G.A.; L.-Cpl. (Actg. Sgt.) P. J. Eccles, No. 562876, R.E.; Cpl. (Actg. Sgt.) H. V. Fisher, No. 562597, R.E.; Co. Qrmr.-Sgt. S. E. Flood, No. 121665, R.G.A.; Flt. Sgt. A. F. J. Forrest, No. 11744, R.F.C.; Actg. Sgt. A. Gard, No. 321108, R.G.A.; Cpl. (Actg. Sgt.) B. Gilbert, No. 118492, R.G.A.; Actg. Bombr. F. Goodwin, No. 119231, R.G.A.; Staff Sgt. (Mech.) C. A. Hadley, No. 564128, R.E.; Gnr. W. E. Hatfield, No. 119362, R.G.A.; 2nd Cpl. (Actg. Staff Sgt.) (Mech.) A. W. Hattersley, No. 562649, R.E.; Actg. Bty. Qrmr.-Sgt. G. W. Hincks, No. 148298, R.G.A.; Sgt. (Actg. Staff Sgt.) W. Hitchmough, No. 540090, R.E.; Sgt. W. Horsley, No. 66805, R.G.A.; Actg. Sgt. W. P. Houghton, No. 121676, R.G.A.; Cpl. (Actg. Sgt.) W. Howe, No. 66943, R.G.A.; Actg. Co. Qrmr.-Sgt. W. R. Howe, No. 21420, R.G.A.; Gnr. E. J. W. Howell, No. 140205, R.G.A.; Gnr. W. Hulme, No. 136953, R.G.A.; Temp. Sgt.-Maj. A. E. Hutton, No. 1775, R.F.C.; Sgt. (Actg. Staff Sgt.) (Mech.) W. C. J. Jocelyn, No. 562452, R.E.; Co. Qrmr.-Sgt. J. R. King, No. 562124, R.E.; Sgt. R. W. Laine, No. 465276, R.E.; Cpl. N. H. Leigh, No. 121680, R.G.A.; Sgt. (Actg. Co. Qrmr.-Sgt.) C. P. Lemon, No. 562372, R.E.; Spr. (Actg. Cpl.) J. Letley, No. 540078, R.E.; Actg. Bombr. T. A. Light, No. 125354, R.G.A.; Fitter Staff Sgt. M. J. MacCarthy, No. 173730, R.G.A.; Sgt. J. Maguire, No. 128861, R.G.A.; Sgt. (Actg. Staff Sgt.) (Mech.) H. Middleton, No. 562076, R.E.; Gnr. R. Owen, No. 112228, R.G.A.; L.-Cpl. (Actg. Stg.) E. Paine, No. 562118, R.E.; Actg. Sgt. E. Palmer, No. 119252, R.G.A.; L.-Cpl. (Actg. Cpl.) W. Patmore, No. 563835, R.E.; Temp. Sgt.-Maj. G. F. Peck, No. 4758, R.F.C.; Actg. Sgt. F. J. Pile, No. 127923, R.G.A.; Gnr. (Actg. Sgt.) W. A. Preece, No. 15827, R.G.A.; Actg. Bombr. R. Rees, No. 128734, R.G.A.; Sgt. W. Richards, No. 279312, R.G.A.; Bty. Sgt.-Maj. F. W. Rimmington, No. 284097, R.G.A.; Gnr. F. G. Rose, No. 118857, R.G.A.; Actg. Sgt. J. Rowe, No. 321237, R.G.A.; 2nd Cpl. (Actg. Cpl.) F. Shakespeare, No. 563557, R.E.; Sgt. F. Smith, No. 132593, R.G.A.; 2nd Cpl. (Actg. Sgt.) T. A. Smith, No. 540030, R.E.; Temp. Sgt.-Maj. W. A. C. Snook, No. SR 13, R.F.C.; Sgt. (Actg. Co. Qrmr.-Sgt.) E. H. Sullivan, No. 562339, R.E.; Gnr. S. Talbot, No. 137673, R.G.A.; Cpl. (Actg. Staff Sgt.) (Mech.) W. R. Thorpe, No. 562233, R.E.; Sgt. E. W. Trevenen, No. 138182, R.G.A.; Gnr. F. Tupper, No. 137606, R.G.A.; Actg. Co. Qrmr.-Sgt. B. F. Twiney, No. 61956, R.G.A.; Sgt. S. F. Upcott, No. 352150, R.G.A.; Actg. Sgt. R. Williams, No. 127927, R.G.A.; Gnr. J. R. Williamson, No. 184385, R.G.A.; Actg. Bombr. E. A. Winny, No. 110288, R.G.A.; Actg. Cpl. G. W. Woodford, No. 119292, R.G.A.; Sgt. (Actg. Co. Qrmr.-Sgt.) J. A. Woodyard, No. 530008, R.E.; Cpl. (Actg. Staff Sgt.) G. A. Yull, No. 530019, R.E.

At the same time it was announced that the names of the following have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with anti-aircraft service in the United Kingdom, and, when applicable, an entry will be made in the records of service of officers and other ranks:—

2nd Lieut. (Actg. Lieut.) A. F. Arnold, R.G.A. (S.R.); Lieut. (Actg. Maj.) E. W. Arnott, R.F.A.; Capt. (Temp. Maj.) L. M. Bennett, R.F.C. (S.R.); Lieut. C. N. Brown, R.G.A.; Capt. (Actg. Maj.) C. M. Campbell, A.M.I.E.E., R.E.; Lieut. (Temp. Capt.) C. G. Cox, R.F.C. (S.R.); Capt. (Temp. Maj.) B. D'A. Corbet, Res. of Off., Gds; Lieut. (Temp. Capt.) R. A. Courtney, R.F.C. (S.R.); Capt. (Actg. Maj.) A. J. Cousin, R.F.A.; Lieut. (Actg. Capt.) H. B. Cox, R.G.A.; Temp. Capt. L. F. Crane, N. Lan. R.; Temp. Lieut. G. C. Daw, R.F.A.; 2nd Lieut. (Temp. Lieut.) T. Death, R.F.A.; Temp. Lieut. W. A. Dunn, R.F.C.; Lieut. (Actg. Capt.) T. F. Ellison, R.G.A.; Capt. L. H. Gay, S. Lan. R. (S.R.); Maj. (Actg. Lieut.-Col.) J. A. Mackenzie-Grieve, R.A.; Lieut. L. C. Gordon, R.G.A.; Capt. (Temp. Lieut.-Col.) J. C. Halahan, Res. of Off., R. Dub. Fus. and R.F.C.; Lieut. (Temp. Maj.) H. W. Hamlett, R.F.A.; Lieut.

Col. J. Harvey, D.S.O., R.D.C.; Lieut. (Actg. Capt.) F. W. M. Herring, R.E.; 2nd Lieut. (Temp. Lieut.) A. Howell, R.E.; Lieut.-Col. R. L. Hutchison, T.D., R.E.; Temp. Lieut. (Actg. Capt.) W. A. Hunter, Gen. Staff, Gen. List; Maj. (Actg. Lieut.-Col.) D. H. K. Hunter, R.F.A.; Lieut. (Temp. Capt.) W. H. James, R.E.; Maj. A. H. Jones, R.E.; Lieut. (Temp. Capt.) R. L. Kennedy, Hrs. and R.F.C.; 2nd Lieut. G. O. King, R.E.; Temp. Lieut. (Temp. Capt.) C. A. Langham, R.F.A.; Lieut. O. W. H. Lewis, R.G.A.; 2nd Lieut. (Temp. Capt.) J. I. Mackay, W. Rid. R. and R.F.C. (killed); Maj. A. R. Martin, T.F. Res. and R.F.C.; Capt. B. S. Millard, R.E.; Lieut. W. A. P. Mitchell, R.G.A.; Lieut.-Col. T. C. W. Molony, D.S.O., R.F.A.; Temp. Maj. R. E. H. Morgan, R.D.C., late R.A.; Lieut. W. B. Nisbit, R.G.A.; Temp. Capt. C. C. Phillips, R.G.A.; Capt. (Actg. Maj.) H. C. Reader, R.G.A.; Capt. (Temp. Lieut.-Col.) J. W. Reid, R.F.A. (Res. of Off.); Capt. (Temp. Maj.) F. M. Roxby, N. Staffs R. and R.F.C.; Temp. Lieut. H. U. Schofield, R.G.A.; Temp. Capt. G. Thomson, R.G.A.; Capt. F. E. B. Whitfield, Welsh R. (S.R.) and R.F.C.; Lieut. (Temp. Capt.) W. E. de B. Whittaker, L'pool R.; 2nd Lieut. (Actg. Lieut.) H. H. Williams, R.G.A. (S.R.); Capt. H. E. F. Wyncoll, M.C., Notts and Derby R. and R.F.C.

Sgt. R. S. Alexander, No. 530075, R.E.; Gnr. A. Anderson, No. 127615, R.G.A.; Cpl. A. G. Andrews, No. 12081, R.G.A.; Sgt. J. T. Ashenden, No. 128597, R.G.A.; Sgt. (Flt. Sgt.) R. Baker, No. 873, R.F.C.; Actg. Bombr. S. H. Baker, No. 358453, R.G.A.; Actg. Qrmr.-Sgt. B. Becton, No. 65434, R.G.A.; Sgt. A. Beddall, No. 530035, R.E.; Actg. Sgt. G. W. Bennett, No. 262719, R.G.A.; Sgt. (Flt. Sgt.) G. H. Bicknell, No. 5011, R.F.C.; Actg. Sgt. A. McG. Black, No. 92746, R.G.A.; Sgt. (Actg. Co. Sgt. Maj.) W. Blake, R.G.A.; 1st A.M. (Actg. Cpl.) G. Blanchard, No. 103013, R.F.C.; Gnr. S. Bode, No. 132184, R.G.A.; Gnr. H. Bodkin, No. 122284, R.G.A.; Spr. C. A. Bold, No. 530105, R.E.; Cpl. (Actg. Sgt.) J. W. Boss, No. 101155, R.G.A.; Sgt. R. Brown, No. 350, R.G.A.; Gnr. F. Burgess, No. 16567, R.G.A.; Actg. Sgt. W. H. Burrow, No. 563408, R.E.; Actg. Cpl. J. T. Bush, No. 562365, R.E.; Sgt. A. H. Care, No. 697, R.F.C.; Cpl. (Actg. Sgt.) C. H. Chandler, No. 147991, R.G.A.; Actg. Sgt. A. J. Cooley, No. 96458, R.G.A.; Co. Qrmr.-Sgt. A. E. Cox, No. 118836, R.G.A.; Cpl. A. A. Crick, No. 90354, R.G.A.; Actg. Sgt. W. H. Cross, No. 119227, R.G.A.; Sgt. G. Crowe, No. 4199, R.G.A.; Gnr. C. Davidson, No. 92768, R.G.A.; Sgt. J. Davies, No. 142478, R.G.A.; Gnr. A. J. Davies, No. 126256, R.G.A.; Actg. full Bombr. L. Davies, No. 119294, R.G.A.; Actg. Cpl. J. Derbyshire, No. 118716, R.G.A.; Sgt. A. J. Dixon, No. 125451, R.G.A.; Pte. (Actg. Regtl. Qrmr.-Sgt.) M. W. Donegan, No. 53052, R.D.C.; Sgt. E. Downer, No. 119222, R.G.A.; Sig. (Flt. Sgt.) J. Edwards, R.F.C.; Actg. Sgt. B. C. Emerson, No. 562495, R.E.; L.-Cpl. (Actg. Co. Qrmr.-Sgt.) W. H. Emmerson, R.D.C.; Sgt. (Flt. Sgt.) B. B. Eves, No. 6255, R.F.C.; Actg. Staff Sgt. Mech. C. H. Fagg, No. 562628, R.E.; Cpl. F. S. Farrow, No. 8473, R.F.C.; Staff Sgt. J. Fell, No. 465132, R.E.; Actg. Sgt. A. J. Fenn, No. 149544, R.G.A.; Actg. Bombr. F. J. Fenn, No. 128865, R.G.A.; Actg. Co. Qrmr.-Sgt. T. J. Frizelle, No. 28287, R.G.A.; Sgt. W. H. Gardiner, No. 90262, R.G.A.; Gnr. W. W. Green, No. 119232, R.G.A.; Sgt. R. Hale Hall, No. 122198, R.G.A.; Gnr. H. E. Halford, No. 358190, R.G.A.; Sgt. (Flt. Sgt.) F. H. L. Harman, No. 2603, R.F.C.; Actg. Bombr. A. Harris, No. 136946, R.G.A.; Actg. 3rd Class Mr. Gnr. G. Harvey, No. 132611, R.G.A.; Actg. Co. Qrmr.-Sgt. R. Hayward, No. 518015, R.E.; Sgt. G. Helliwell, No. 19892, R.F.C.; Sgt. J. Hick, No. 466182, R.E.; Sgt. G. E. Hill, No. 2060, R.F.C.; Actg. Sgt. W. Hill, No. 279772, R.G.A.; Temp. Sgt.-Maj. V. Howe, No. 1773, R.F.C.; Actg. Sgt. G. W. Hunt, No. 562361, R.E.; Actg. Sgt. G. E. Inns, No. 562590, R.E.; Actg. Cpl. C. W. Jacobs, No. 562260, R.E.; Actg. Sgt. J. H. James, No. 376444, R.G.A.; Actg. Sgt. R. H. James, No. 563129, R.E.; Sgt. (Flt. Sgt.) H. Jennings, No. 5280, R.F.C.; Sgt. (Flt. Sgt.) H. N. Johnson, No. 2592, R.F.C.; Sgt. A. Jolly, No. 284120, R.G.A.; Actg. Sgt. G. B. Jones, No. 145943, R.G.A.; Actg. Sgt. C. D. W. King, No. 119241, R.G.A.; Actg. 2nd Cpl. J. B. Knowles, No. 564063, R.E.; Gnr. H. Manning, No. 119371, R.G.A.; Cpl. C. D. Marrows, No. 530313, R.E.; Sgt. A. Mitchell, No. 10894, R.F.C.; Actg. Bombr. A. E. Monk, No. 174870, R.G.A.; Sgt. R. W. Muir, No. 18501, R.F.C.; Actg. Sgt. F. W. Newbolt, No. 562202, R.E.; Sgt. (Flt. Sgt.) R. Nicholls, No. 1321, R.F.C.; Actg. Cpl. J. Nixon, No. 92787, R.G.A.; Actg. Sgt. J. Padbury, No. 562139, R.E.; Sgt. T. J. Page, No. 168667, R.G.A.; Gnr. A. Palmer, No. 121554, R.G.A.; Cpl. H. Payne, No. 14006, R.F.C.; Sgt. W. Pearce, No. 530295, R.E.; Sgt. (Flt. Sgt.) C. F. Pike, No. 3092, R.F.C.; Gnr. P. Pringle, No. 94534, R.G.A.; Pte. (Actg. Staff Sgt.) (Mech.) A. J. Ralph, No. T. 22735, A.S.C. (M.T.); Actg.



Staff Sgt. F. A. Robinson, No. 540541, R.E.; Cpl. S. Rushworth, No. 118493, R.G.A.; Bombr. H. E. Salmon, No. 118828, R.G.A.; Actg. Sgt. S. G. Sanders, No. 143930, R.G.A.; Spr. W. H. Schofield, No. 563888, R.E.; Actg. Cpl. A. Shacklady, No. 563722, R.E.; Sgt. (Flt. Sgt.) G. W. Shaw, No. 3065, R.F.C.; Actg. Sgt. A. H. Shutter, No. 562602, R.E.; Gnr. J. Smith, No. 97651, R.G.A.; Actg. Cpl. P. C. Smith, No. 562505, R.E.; Sgt. P. J. Spall, No. 136779, R.G.A.; Actg. Cpl. H. J. Squires, No. 88661, R.G.A.; Actg. full Bombr. W. S. Stead, No. 128736, R.G.A.; Actg. Co. Qrmr.-Sgt. R. J. Strachen, No. 562442, R.E.; Sgt. F. Taylor, No. 128741, R.G.A.; Sgt. W. Taylor, No. 157796, R.G.A.; Actg. Cpl. J. J. Terry, No.

118696, R.G.A.; Bty. Sgt.-Maj. H. Tingley, No. 89622, R.F.A.; Sgt. A. Tomkinson, No. 132221, R.G.A.; Actg. Sgt. H. A. Turk, No. 540094, R.E.; Actg. Staff. Sgt. Mech. D. J. Walker, No. 465421, R.E.; Actg. Bty. Qrmr.-Sgt. E. T. Wall, No. 121939, R.G.A.; Sgt. T. Wall, No. 148124, R.G.A.; Cpl. H. Wells, No. 40260, R.F.C.; Pte. (Actg. Staff Sgt.-Maj.) E. N. Westfield, No. S 38954, A.S.C.; Temp. Sgt.-Maj. E. S. Weston, No. 20551, R.F.C.; Sgt. (Flt. Sgt.) W. Williams, No. 12176, R.F.C.; Cpl. C. J. Wilson, No. 22600, R.F.C.; Cpl. (Actg. Sgt.) E. Woorberry, No. 3401, R.F.C.; Cpl. (Actg. Sgt.) J. Worrall, No. 168794, R.F.A.; Sgt. H. W. Youngman, No. 284280, R.G.A.



## Convalescent Home for R.O.C. Officers.

By the generosity of members of the Over-Seas Club, a convalescent home for flying officers in the R.F.C., entitled the R.F.C. Auxiliary Hospital, Over-Seas Club branch, has been opened near Croydon, at Shirley Park, which affords many facilities for out-door recreation. Every room or ward in the house will be named after some part of the British Empire, or some British community in a foreign country, which is contributing towards its upkeep.

## Fatal Accidents.

CAPT. R. H. P. MIERS, R.F.C., was killed while flying in England on December 12th.

A VERDICT of "Accidental Death" was returned at a Hertfordshire inquest on December 16th on 2nd Lieut. J. L. Andrews, R.F.C., who fell from an aeroplane and fractured his skull and neck.

"He was probably doing some fancy flying to please some spectators," said a witness at a Norfolk inquest, on Flight-Sergt. J. H. R. Green, whose machine fell 3,000 feet to earth. A verdict of "Accidental Death" was returned.

Lieut. T. Manuel, a Canadian, was killed in a flying accident on the afternoon of December 18th, in Essex.

## An Irish Aeroplane Factory.

RECENTLY Ireland and aviation was dealt with in these columns. It is now stated in the Dublin press that the establishment of an aeroplane factory for Ireland is at present under consideration by the Air Ministry. Members of the Nationalist Party have had interviews with officials of the Ministry, and it is hoped that a definite statement on the subject will be made within the next week.

Two motor manufacturers in Dublin are prepared to invest large sums in the development of the project. One of them has agreed to contribute up to £50,000 for the purpose of manufacturing engine parts.

## A World's Height Record.

LIEUTENANT PAPA has beaten his own world's "record"

for high flying with a passenger, says the *Times* Milan correspondent. On an Italian machine he rose 7,075 metres [23,200 feet], returning to camp after an hour and five minutes' absence. He broke the "record" last May, rising to 6,435 metres [21,000 feet]. Lack of oxygen prevented an even higher flight this time.

## Aeroplane Attacks on Italian Front.

"In the last attacks upon Mount Solarolo the enemy employed a new manœuvre," says the *Times* correspondent at the Italian headquarters, writing on December 16th. "Instead of following the artillery hammering of the Italian trenches by immediate infantry attacks, he made a concerted raid of aeroplanes, which, coming low down, passed in order above the trenches and raked them with machine-guns."

## German Aeroplane in Holland.

ACCORDING to the *Nieuwe Rotterdam Courant*, a German biplane landed on Tuesday evening in Limburg Province, south-east Holland, owing to a defect in the motor. Both its occupants, an officer and a non-commissioned officer, have been interned.

## Another German Squadron Leader Killed.

A MESSAGE from Berlin states that Lieut. Erwin Böhme, who succeeded to the command of Capt. Boelke's squadron, has been killed on the Western Front. He was credited with bringing down 24 Allied aeroplanes.

## To Readers—One and All.

THE Editor of "FLIGHT" will at all times be pleased to consider original articles (illustrated or otherwise) on subjects directly or indirectly allied with aviation. All articles accepted will be paid for; a high literary standard of writing is not essential; it is the facts which matter. Practical explanatory articles are most acceptable. Diagrams and similar illustrations need only be rough sketches if necessary.



Captain Richt-  
hofen's "Bag."—  
Captain Baron  
von Richthofen  
has decorated the  
walls of his room  
with trophies  
taken from aero-  
planes brought  
down by him.  
(La Guerre  
Aérienne.)





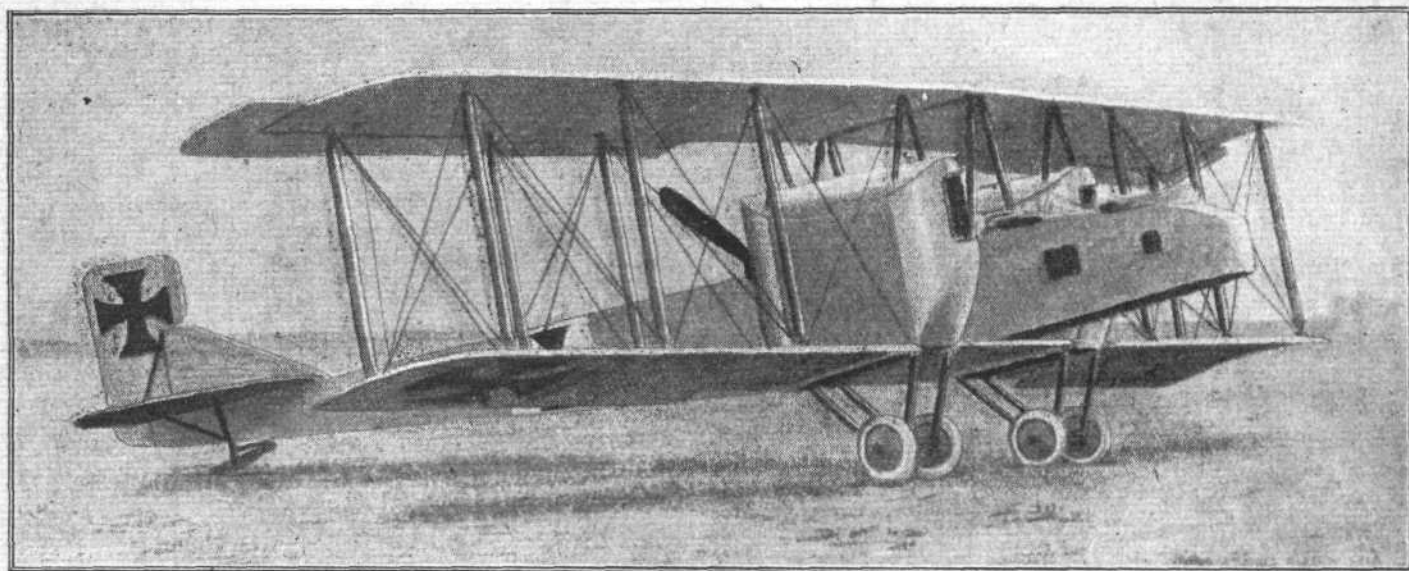
## THE GOTHA TWIN-ENGINEED BOMBING BIPLANE.

WE are able this week to give our readers some further particulars and illustrations of the Gotha bombing-type biplane. From the various samples that have fallen into the hands of the Allies, it would appear that the Gotha bomber has been altered in design, as regards certain details, from time to time. The accompanying scale drawings, therefore, should be looked on as being approximately correct as regards the general design of the Gotha machine.

The total span of the top plane is 78 ft. and that of the lower plane 72 ft. It will be noticed that the top plane, which is in two sections, is given a sweep-back from centre to tips, whilst the lower plane is similarly swept back only from the engine nacelles to the tips, the central plane section between the nacelles being "straight." The amount of sweep-back appears to vary according to type, but 5° may be taken as being about correct. It will be further noticed that the ribs are at right angles to the spars, and the interplane struts are not, therefore, in line when viewed from the front as is general practice. The only advantage one can see in such an arrangement would be cheapness

being connected by steel struts. The *ailerons* on the top plane are balanced by a small portion extending beyond the wing tip as shown, and are hinged to the rear spars by strap hinges. They are built up of steel tubing, and are operated by a crank arm curving over the rear main spar with its end projecting in a slot formed in the plane—a practice common on German machines.

Top and bottom planes are separated by three pairs of interplane struts a side. These are of steel tubing, streamlined by means of wood fairings and bound with fabric. The interplane struts are attached to semi-spherical fittings mounted on the main spars, and, as may be seen from one of the accompanying sketches, the wire bracing attachment is somewhat novel. The bracing cable is passed through a hole in a cigar-shaped steel fitting and spliced: a bolt on the spar fitting screws into the end of the cigar-shaped fitting, which is locked by a piece of wire. Adjustment is apparently made by screwing the cigar-shaped fitting by means of a tommy bar inserted in another hole drilled at the pointed end of the fitting. Portions of the trailing



THE GOTHA TWIN-ENGINEED BOMBING BIPLANE.—Three-quarter front view.

and ease in construction, but it is doubtful if this is really "worth the candle," when one considers the loss in efficiency that must arise therefrom, especially due to the resistance offered by the ribs should the fabric become a bit slack.

The top plane sections are connected by steel tongues or plates on the inverted V *cabanes* supporting the plane above the *fuselage*—these tongues being inserted into clips on the wing spars.

The main spars of the top plane are of I section ash with three-ply glued over the spindled-out portions on each side and wrapped with fabric, giving the equivalent of a rectangular section. The ribs are built up of three-ply webs, cut out for lightness and pine flanges. At each pair of interplane struts, and also between each pair, are tubular steel compression struts. These are held in sockets bolted on the spars, and each bay—which is practically square—is braced with single-strand cable. The spars of the lower plane are of similar construction to the top ones, except that pine is employed instead of ash.

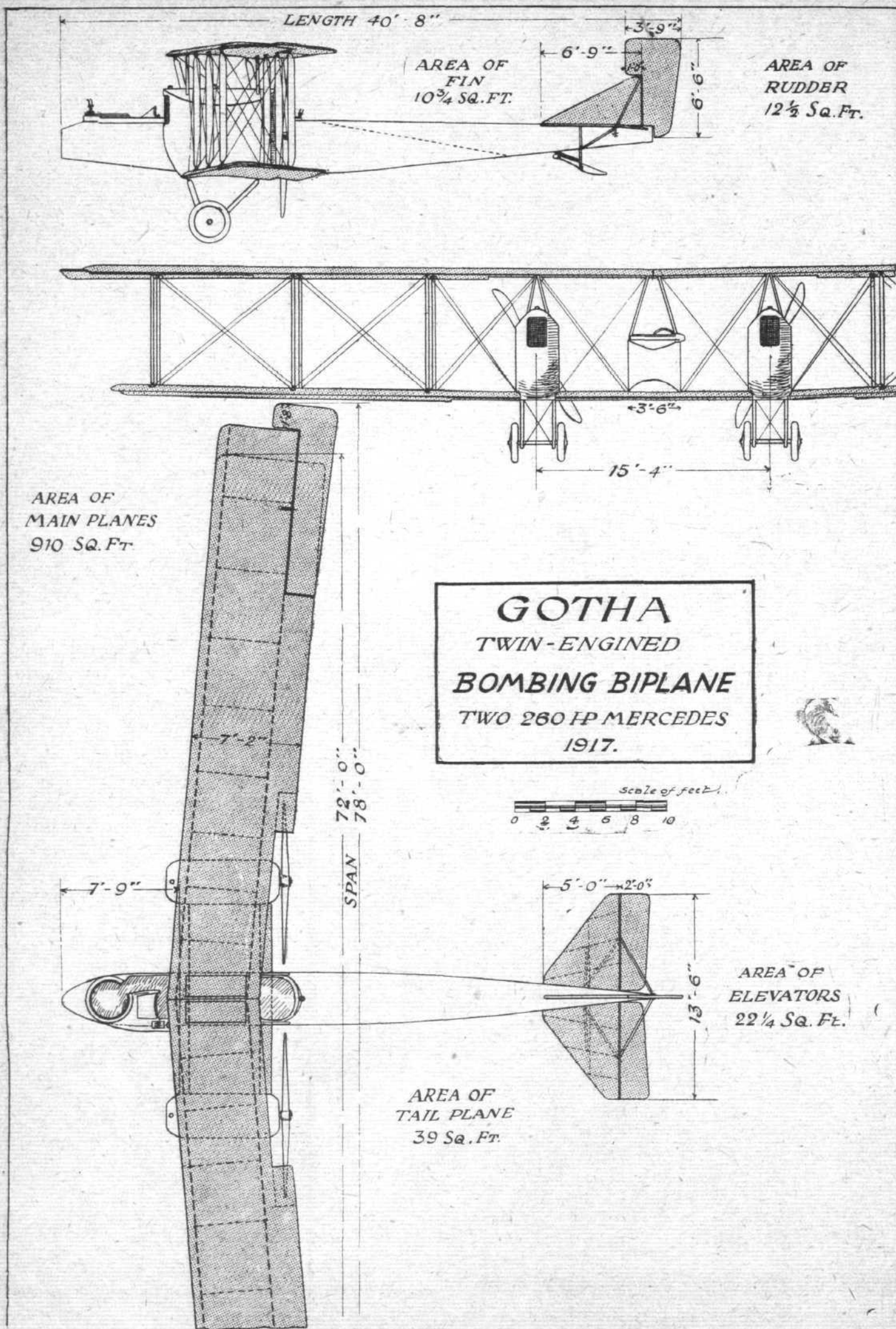
Some models are provided with *ailerons* on both top and bottom planes, upper and lower *ailerons*

edges of both top and bottom planes are cut away to give clearance for the propellers.

All the tail planes, stabiliser, fin, elevators, and rudder, are constructed of steel tubing, the various members being welded together. No wire bracing is, however, employed. The rudder and elevators are, like the *ailerons*, hinged with strap hinges, and the two elevators are coupled together to work in unison. The stabilising plane is braced top and bottom by steel tubes. The Dep. type of control is employed, the wheel column being mounted on a tubular steel rocking shaft supported in bearings on the lower *fuselage longerons*. The elevator control cables are attached to quadrants mounted above and below the rocking shaft. The *aileron* control cables are attached to the ends of a chain on a sprocket wheel mounted on the control wheel shaft. The cables pass over pulleys at the bottom of the control column, through the rocking shaft, and inside the lower plane to the *ailerons*. The rudder is operated by a pressed steel bar fitted with neat stirrups for the pilot's feet. The engine control is situated at the pilot's left hand.

The *fuselage* is of almost square section, tapering





THE GOTHA TWIN-ENGINE BOMBER.—Plan, front and side elevations to scale.



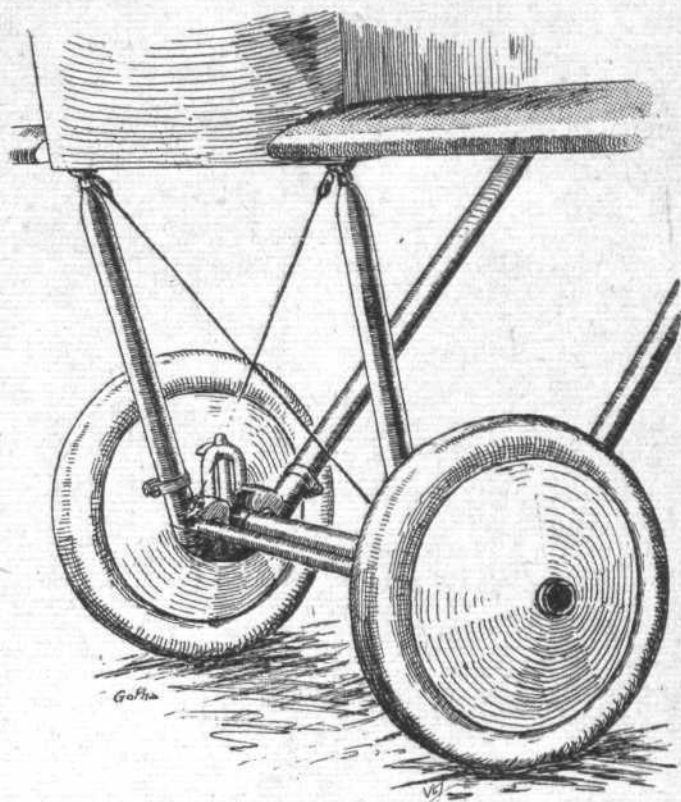
to a vertical knife edge at the rear and a rounded point at the front. The maximum depth and width is about 3 ft. 6 ins. and the length is 39 ft. It is built up of four *longerons*, which are of laminated ash in front and pine at the rear, and cross struts, cable and wire braced.

The *longerons* are spindled out in places, and where spindled have a covering of three-ply. The *longerons* gradually taper in section from the centre, and, on the whole, are not particularly striking as regards strength. The covering of the *fuselage* is of three-ply, tacked to the *longerons* and cross struts. Behind the rear cockpit the bottom of the *fuselage* is tunnelled out so as to enable the gunner to fire rearwards and downwards—there are, therefore, no cross struts bracing the lower *longerons* at this part, which is indicated by a dotted line in the side elevation in the scale drawings.

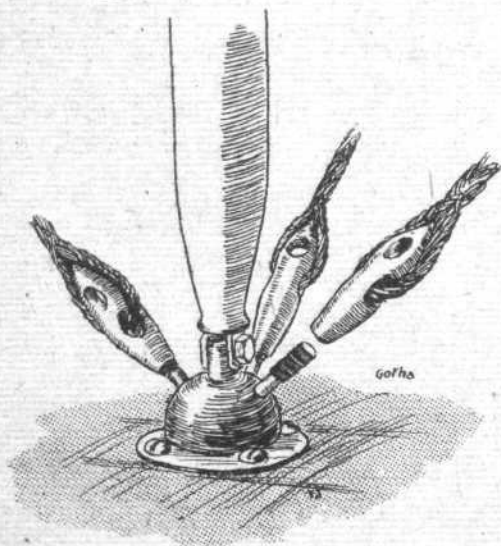
The arrangement of the cockpits is as follows:—In the nose is a circular cock-pit for the forward gunner, the gun being mounted on a semi-circular rail. Behind the front cockpit, and just forward of the main planes, is the pilot's compartment. The seat is a little to the starboard side, there being a gangway on the port side, leading from the front cockpit to the pilot's and after gunner's compartments. The latter compartment is situated at the trailing edge of the planes, and is provided with a gun mounting on the top of the *fuselage*, as well as the tunnel gun previously mentioned.

☐ The engines are each 260 h.p. 6-cyl. Mercedes, mounted some 15 ft. apart, and completely enclosed within housings of three-ply and sheet aluminium. A honeycomb radiator is mounted in front of the engine on extensions of the bearers, and below the engine are located the fuel tanks. The engines are supported on stout spruce bearers connected by

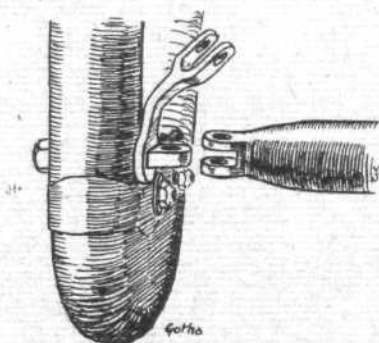
of the V's are connected at their lower ends by a tubular tie-rod, the anchorage for the cross-bracing being at the attachment of the tie-rod, as shown in one of the accompanying sketches. The shock absorbing



THE GOTHA TWIN-ENGINE BOMBER.—One of the under-carriages, in which steel compression springs and cable within the chassis struts, and connected to the axle, take the place of rubber shock absorbers.



The interplane strut fitting on the Gotha twin-engine bomber.



The attachment of the bracing tie-rod and cable on the chassis of the Gotha bomber.

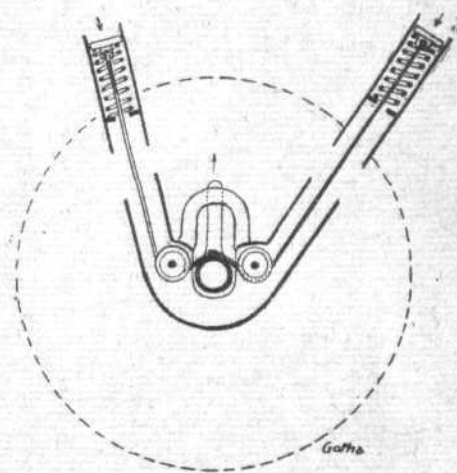


Diagram showing the shock-absorbing device on the Gotha bomber.

tubular struts to the lower plane sections; the whole of this engine frame is wire braced.

Below each engine nacelle is a two-wheeled under-carriage, consisting of a pair of tubular steel V members, streamlined with wood fairings and fabric bound, carrying a tubular axle, which is, we believe, also streamlined by a fairing. The front members

system is of particular interest, in that rubber is not employed. Instead, two lengths of cable attached to the axle pass under pulleys mounted in the axle box, formed by the apex of the V, and up each of the chassis tubes to a long steel compression spring within the latter. This arrangement is shown diagrammatically in one of our sketches.

#### The R.N.A.S. on the Film.

AMONG the official war films which have recently been prepared under the auspices of the War Office Cinematograph Committee is one dealing with the work of the R.N.A.S., which was shown for the first time on December 18th at the

Scala Theatre, Fitzroy Square. Showing as they do the activities at an air station in this country and the methods of instruction, besides providing glimpses of the more naval side of the R.N.A.S. activities, such as submarine spotting, &c., the popularity of the pictures is assured.



# THE ROLL OF HONOUR.

Reported by the Admiralty:—

**Previously Missing, now reported Killed.**  
Flight Sub-Lieut. W. J. Burnett, R.N.

**Drowned.**  
F13151 Air-Mech. (2nd Gr.) F. N. Scarles, R.N.A.S.

**Died of Accidental Injuries.**  
F10371 Air-Mech. (2nd Gr.) R. W. Wood, R.N.A.S.

**Accidentally Injured.**  
Flight Lieut. A. B. Shearer, R.N.

**Previously Missing, now reported Prisoner.**  
Flight Lieut. (Paymaster R.N.) W. S. Magrath, R.N.

Reported by the War Office:—

**Killed.**  
2nd Lieut. R. D. Bennett, R.F.C.  
2nd Lieut. G. A. Carter, R.F.C.  
2nd Lieut. G. A. Cawson, R.F.C.  
2nd Lieut. W. K. Nunnerley, R.F.C.  
2nd Lieut. R. Winnicott, M.C., Devon., attd. R.F.C.

**Previously Missing, now reported Killed.**  
2nd Lieut. A. R. Baker, R.F.C.  
Lieut. C. Barry, R.Ir.R., attd. R.F.C.  
2nd Lieut. D. P. Cox, R.F.C.  
2nd Lieut. C. M. DeRochie, R.F.C.  
2nd Lieut. S. J. Oliver, R.F.C.  
2nd Lieut. L. W. Middleton, R.F.C.  
2nd Lieut. C. A. Moody, R.F.C.  
2nd Lieut. K. N. S. Skeffington, R.F.C.  
2nd Lieut. H. D. B. Snelgrove, R.F.C.  
2nd Lieut. F. E. Winsor, R.F.C.

**Accidentally Killed.**  
Lieut. L. E. Van Buskirk, Cav., attd. R.F.C.

**Died of Wounds.**  
2nd Lieut. C. W. M. Nosworthy, R.F.A., attd. R.F.C.  
2nd Lieut. A. C. Ross, R.Scot. F., attd. R.F.C.  
2nd Lieut. H. V. Young, R.F.C.

**Previously Missing, now reported Died as Prisoner in German hands.**  
Lieut. K. W. Holmes, Aus.F.C.

**Wounded.**

2nd Lieut. J. A. Baker, R.F.C.  
2nd Lieut. J. Boyd, R.F.C.  
Lieut. J. E. Cole, Queb., attd. R.F.C.  
2nd Lieut. W. A. Coupar, R.F.C.  
Lieut. W. E. Dexter, B.Col., attd. R.F.C.  
Lieut. B. M. Harmon, M.C., B.Col., attd. R.F.C.  
2nd Lieut. J. Hetherington, R.F.C.  
Lieut. J. R. Hodgkinson, W. Yorks, attd. R.F.C.  
2nd Lieut. E. R. James, R.F.C.  
Capt C. T. Lally, M.C., R.F.C.  
2nd Lieut. J. C. O. Nelson, R.F.C.  
2nd Lieut. O. I. Norton, R.F.C.  
2nd Lieut. D. Parker, R.F.C.  
2nd Lieut. D. C. Russell, R.F.C.  
2nd Lieut. J. A. Rutherford, R.G.A., attd. R.F.C.  
Lieut. A. Satten, W. Ont., attd. R.F.C.  
2nd Lieut. F. K. Sheppard, Aus. F.C.  
2nd Lieut. J. Sturrock, Yeo., attd. R.F.C.  
2nd Lieut. J. D. F. West, R.F.C.

**Previously reported Prisoner, now reported Wounded and Prisoner in German hands.**

2nd Lieut. H. Ibbotson, R.F.C.

**Previously reported Wounded, now reported Not Wounded.**

2nd Lieut. S. E. Dreschfeld, R.F.C.

**Missing.**

2nd Lieut. L. G. H. Brown, R.F.C.  
2nd Lieut. T. W. Calvert, R.F.C.  
2nd Lieut. H. A. Dyer, R.F.C.  
2nd Lieut. M. G. Gunn, R.F.C.  
2nd Lieut. S. Kendall, R.F.C.  
2nd Lieut. L. G. Nixon, R.F.C.  
2nd Lieut. C. E. Ogden, R.F.C.  
2nd Lieut. A. W. Palmer, R.F.C.  
2nd Lieut. C. S. Reed, R.F.C.  
2nd Lieut. C. G. V. Rennells-Moss, R.F.C.  
Lieut. L. N. Ward, Aus. F.C.  
2nd Lieut. W. Whitaker, R.F.C.  
Lieut. H. Whitworth, Sher. For., attd. R.F.C.  
2nd Lieut. H. A. Yeo, R.F.C.

## INTERNATIONAL AIRCRAFT STANDARDS.

(Continued from page 1340.)

3N6—Specifications for Soft Brass Sheet.

**GENERAL.**—1. The general specification 1G1 shall form, according to their applicability, a part of these specifications.

**MATERIAL.**—2. (a) The brass shall have the following chemical composition:

	Per cent.
Copper .. .. .	79 to 85
Lead, maximum .. .. .	0.15
Iron, maximum .. .. .	0.08
Zinc .. .. .	Remainder.

(b) Drillings or clippings for analysis shall be taken from both ends of the coil sampled and shall be free from all surface oxide or dirt.

**MANUFACTURE.**—3. (a) The brass used shall be crucible melted from lake or electrolytic copper according to I.A.S.B. specification 2N2, and spelter B or C grade according to I.A.S.B. specification 2N3.

(b) No scrap shall be used except such as may accumulate in the manufacturer's plants from material of the same composition and of their own make.

(c) All sheet must be fully annealed after rolling.

**WORKMANSHIP AND FINISH.**—4. The surface of the brass shall be clean and smooth, and it shall be free from injurious defects such as blisters, slivers, or dirt embedded in the surface.

**PHYSICAL PROPERTIES AND TESTS.**—5. (a) Specimens taken from any lot shall have a minimum tensile strength of 40,000 lbs. per square inch (28.12 kg. per mm.).

(b) A specimen similar to test sample must withstand being bent double in any direction and hammered flat, so that a gauge set at twice the thickness of the metal will pass freely over the bend.

**SELECTION OF TEST SPECIMEN.**—6. When shipments are made in coils a specimen from every tenth coil shall be taken for physical tests. When shipments are made in short lengths a specimen will be taken from each case.

**DIMENSIONS AND TOLERANCES.**—7. The tolerances allowed shall be as given in the following table:—

**TOLERANCES. ENGLISH UNITS.**

American Wire Gauge (B. & S.).	Thickness, inches.	Tolerance, inches.			
		Less than 5 ins. wide.	5 to 8 ins. wide.	8 to 11 ins. wide.	11 to 14 ins. wide.
No. 8 to 14	0.1285 to 0.0641	±0.0029	±0.0033	±0.0036	±0.0040
No. 15 to 18	0.0571 to 0.0403	±0.0025	±0.0029	±0.0033	±0.0037
No. 19 to 24	0.0359 to 0.0201	±0.0020	±0.0024	±0.0028	±0.0032
No. 25 to 28	0.0179 to 0.0126	±0.0016	±0.0020	±0.0024	±0.0028
No. 29 to 32	0.0113 to 0.0080	±0.0013	±0.0017	±0.0020	±0.0024

**METRIC UNITS.**

American Wire Gauge (B. & S.).	Thickness, millimetres.	Tolerance, millimetres.			
		Less than 127 mm. wide.	127 to 203 mm. wide.	203 to 279 mm. wide.	279 to 356 mm. wide.
No. 8 to 14	3.264 to 1.628	±0.074	±0.084	±0.091	±0.102
No. 15 to 18	1.450 to 1.024	±0.064	±0.074	±0.084	±0.094
No. 19 to 24	0.912 to 0.511	±0.051	±0.061	±0.071	±0.081
No. 25 to 28	0.455 to 0.321	±0.041	±0.051	±0.061	±0.071
No. 29 to 32	0.286 to 0.202	±0.033	±0.043	±0.051	±0.061

**DELIVERY, PACKING AND SHIPPING.**—8. (a) When orders call for 12-ft. (3.66-m.) lengths, the following tolerances as to lengths will be allowed, but in no case shall the aggregate amount of these short lengths exceed 40 per cent:—

40 per cent. may be 10 ft. (3.05 metres) or over.  
30 per cent. may be 8 ft. (2.44 metres) to 10 ft. (3.05 metres).  
20 per cent. may be 6 ft. (1.83 metres) to 8 ft. (2.44 metres).  
10 per cent. may be 4 ft. (1.22 metres) to 6 ft. (1.83 metres).

When orders call for 10-ft. (3.05-m.) lengths, the following tolerances as to lengths will be allowed, but in no case shall the aggregate amount of these short lengths exceed 40 per cent:

40 per cent. may be 8 ft. (2.44 metres) or over.  
30 per cent. may be 6 ft. (1.83 metres) to 8 ft. (2.44 metres).  
20 per cent. may be 4 ft. (1.22 metres) to 6 ft. (1.83 metres).  
10 per cent. may be 2 ft. (0.61 metre) to 4 ft. (1.22 metres).

When orders call for 8-ft. (2.44-m.) lengths, the following tolerances as to lengths will be allowed, but in no case shall the aggregate amount of these short lengths exceed 30 per cent:

30 per cent. may be 6 ft. (1.83 metres) or over.  
20 per cent. may be 4 ft. (1.22 metres) to 6 ft. (1.83 metres).  
10 per cent. may be 2 ft. (0.61 metre) to 4 ft. (1.22 metres).

When orders call for 6-ft. (1.83-m.) lengths, the following tolerances as to lengths will be allowed, but in no case shall the aggregate amount of these short lengths exceed 20 per cent:

20 per cent. may be 4 ft. (1.22 metres) or over.  
10 per cent. may be 2 ft. (0.61 metre) to 4 ft. (1.22 metres).

(b) Coils shall not contain more than four lengths, and lengths shall be at least 10 ft. (3.05 m.) long.

(To be continued.)



# METEOROLOGY IN RELATION TO AERONAUTICS.

By W. H. DINES, D.Sc., F.Aë.S., F.R.S.

(Concluded from page 1346.)

*The Wind.*—It will be well to separate the effect of the wind upon an aeroplane into two separate parts, and then to discuss the present possibilities of foretelling what wind is likely to be found at any given height. The wind is decidedly the most important element with which an airman has to deal.

The first point to be considered is the gustiness, but this is a matter on which the meteorologist cannot give much information; he looks rather to receive information from those engaged in the practical business of flying. He knows, indeed, that winds at the surface of the earth possess very different characters in this respect, but he does not know to what extent the local situation is responsible for variation in the steadiness of the wind. On the coast winds off the sea are much steadier than winds off the shore, as well as being stronger. So much is this the case that the anemograms from a coast station are as a rule distinguishable at a glance from anemograms from an inland station like Kew, but the better the exposure of the anemometer at an inland station the steadier is the wind recorded. A better exposure means in general a greater height above the ground, and steadier winds are met with as the altitude is increased. The steadier winds from the sea and at greater heights is due to the absence of obstacles like trees, houses, hills, &c., which break up the steady flow of air and cause eddies, and these eddies will travel a long way down the wind, as is proved by the following curious fact observed at Southport. At Southport the anemometers are erected about 1 mile from the town, at Marchside, on the bank of the Ribble, and the exposure is an excellent one as the country is flat for miles round. The station is in charge of Mr. Baxendell, and he noticed that the trace showing the direction of the wind always changed its character as the wind shifted through a certain definite point of the compass. The cause of this was sought for in vain for some time, but at last it was noticed that the critical direction coincided with the bearing of the last house on the parade on the Southport front, which house was at least a mile distant. This shows the long distance to which the effect of an obstacle may extend.

It is difficult to define the terms "gustiness," because it is only a question of how long a gust lasts whether it should be called a gust or a squall. The numerical measure of the gustiness of the wind is obtained from a self-recording anemometer by taking the difference between the maximum and minimum velocity for a given time and dividing the difference by the mean velocity for the same time. In the absence of marked squalls and for a wind neither increasing nor falling this is a perfectly good measure, but obviously should a squall occur in the chosen interval the ratio may reach quite a high value. With one hour as the interval and using the pressure tube anemometer as the standard for measuring the velocity of the gusts and lulls, a ratio of  $\frac{1}{2}$  denotes a very steady and a ratio of  $\frac{3}{2}$  a very gusty wind.

*The Drift caused by the Wind.*—Much misconception appears to exist as to the effect of a steady wind upon the steering and course of an aeroplane, and since the matter is quite simple it may be well to set it out, starting from first principles.

In what follows by a steady wind is meant a wind in which each particle of air is travelling with the same uniform velocity and in the same direction as every other particle, and in so far as the drift and course to be set are concerned, a gusty wind has exactly the same effect as a steady wind of the same mean velocity. Now as soon as an aeroplane has left the ground, save in the important matter of drift, it is quite immaterial to it in what direction and with what velocity the wind is blowing. The aeroplane shares the velocity of the wind, but in all other respects it is quite unaffected by it. The case is exactly the same as that of a man walking about on the deck of a steamer on a calm sea; he walks about in exactly the same way, whether the steamer is anchored or is moving, and if he be in the saloon, out of sight of fixed objects of reference, he cannot tell in the slightest degree in which direction he is moving, neither, save by inference from the noise of the engines, can he tell the speed. The steamer itself is possibly being carried by a tidal current as well as by its own motive power, and the navigating officer, so far as his own observation goes, is in the same position with regard to the effect of the tide. But there is this very important distinction between the navigating officer of a vessel and the pilot of an aeroplane when both are out of sight of objects of reference. The officer knows

beforehand very closely what current he may expect to find at the precise time and place in which he is, but this knowledge is very imperfect for the pilot; moreover a tidal current or a drift of the vessel, though wind is in general quite small in comparison with the motion of the vessel through the water, whereas the wind which is carrying an aeroplane may have the same or even a greater speed than that of the aeroplane itself. It is this latter fact which makes the wind, even when steady, such an important element in practical aviation.

The rule by which the position is found of an aeroplane having a known velocity through the air—the velocity indicated after correction for density by the speedometer—and subject to a wind of known velocity and direction, is quite simple, and is best shown by a diagram.

Suppose the aeroplane to start from A and to be kept by the rudder and compass apparently heading in the direction AB. Let AB be the distance travelled through the air in a given time, say 1 hour. Then if it were a dead calm, after 1 hour the aeroplane would be at B. Suppose a pilot balloon sent up from A with its lift adjusted to float at the same height as the aeroplane, and suppose that 1 hour later it has moved to C. Complete the parallelogram ABDC so that D is the corner opposite A, and then D will be the position of the aeroplane after 1 hour.

The practical problem is, starting from a point A with the intention of flying to a point F to know what course to follow. It is necessary for the purpose to know the speed of the machine and the speed and direction of the wind. The geometrical solution is as follows:—

From a map set out the direction AF and draw AC from A in the direction of the wind and of such a length that AC represents the velocity of the wind in any convenient scale. With centre C and a radius representing in the same scale the speed of the machine, describe a circle cutting AF in D. Then CD or a parallel line AB gives the course to be followed, and  $AF \div AD$  will give the number of time units that the flight will take.

In general, the circle will cut AF in two points, the one nearest F should be taken, also it may not cut it at all, in which case the wind is too strong to render the proposed flight possible. Since AC may make any angle with AF, in the majority of cases AD will be less than CD, and, therefore, on the whole, the wind increases the time of flight, and if the return journey is to be made under the same conditions of wind the whole time is inevitably increased.

Of course, in most instances the course from one place to another is followed by a series of landmarks, but cases arise when it is not possible to see the landmarks, and, therefore, it is of importance to know the strength and direction of the wind. This is a purely meteorological problem, and if it can be solved, and if also the difficulty about steering by compass can be overcome, two ifs in both of which there is much virtue, then it will be possible to take an aeroplane from one place to another with the same certainty as there is in taking a vessel from one port to another by dead reckoning alone.

*Estimate of the Wind.*—There is no difficulty in determining the velocity and direction of the wind at the surface, but it is a knowledge of the wind at greater heights that the pilot of an aeroplane requires. The greater the height the more uncertain must any estimate become, but even at a few thousand feet the wind in most cases will differ considerably from the surface wind. The question, therefore, is to what extent can we infer the conditions that prevail at, say, 3,000, 6,000 and 9,000 ft. from surface conditions that we can ascertain.

The means of observing the upper winds are observations of clouds, kites, and pilot balloons, but in all these cases the observation is confined to the space below the lowest sheet of clouds and above that sheet we have no power of observation. It is, however, just when the ground is hidden by a low cloud sheet that the knowledge is most required. Fortunately, there is no reason to suppose that the connection between the surface and the upper wind is different when it is cloudy and when it is clear; in my own experience of kite flying I do not remember any break in continuity at the surface of a cloud layer rather than at any other level.

If a person stands facing the wind and there are low clouds in sight, he will generally find that the clouds are coming somewhat from his right, and he will also infer, and rightly so, that the wind is stronger at the cloud level than at the surface. How much stronger will depend upon the exposure of the station, but as a rough rule it may be said that at an inland station at 2,000 ft. the wind will have doubled in velocity,



and will have veered two points. At a coast station a sea wind will have increased perhaps 50 instead of 100 per cent. At greater heights the wind will probably continue to veer and increase in strength, but nothing like to the same extent, and perhaps the best way of giving the average result is to say that with increasing altitude the westerly component will increase in strength. This is equivalent to a considerable veering at heights above 5,000 ft. in south and south-east winds, and to a small backing very often in north and north-west winds. All that one can infer from the surface wind is that at an elevation of a few thousand feet the wind will be roughly doubled in velocity and will have veered a few points.

For many years past, years before the war, the Meteorological Office have had enquiries addressed to them from artillery officers and others as to the strength and direction of the upper wind, and their experience has led them to the belief that the most reliable estimate can be made from the distribution of the surface barometric pressure. There is not time or space to go fully into this matter, and a brief statement must suffice.

If a person stands in the northern hemisphere with his back to the wind, he will have the lowest barometer on his left hand; if the wind is strong, then the fall of the barometer from right to left will be rapid, if light, the change in barometric height will be small. This is Buys' Ballot law.

At first sight, it would appear as though the wind would blow from places of high to places of low barometer, but a little consideration shows that such conditions could only be very short lived. For if air flowed into a low-pressure area to any appreciable extent it would only take a time to be measured in minutes for the low-pressure area to be filled up by the incoming air, and to be replaced by a high-pressure area. Observational facts make it perfectly clear that on the average, at the height of a few thousand feet, the wind blows along the line of places where the pressure is equal, along the lines which on a weather chart are called isobars, lines that is, of equal pressure. Also the velocity is proportional to the barometric gradient, that is, to the change in the height of the barometer along a line at right angles to the isobar.

The reason for this lies in the rotation of the earth on its axis, and a comparatively simple mathematical process enables us to calculate the precise velocity of the wind that should correspond to a given barometer gradient in any place. The wind coinciding in direction with the isobar and with a velocity computed by the formula is called the "gradient wind," and if the wind be asked for in the strata commonly used by aeroplanes, the best answer is to give the gradient wind. For straight isobars the formula is  $v = 2\omega r \sin \phi$  where  $v$  is the barometric gradient,  $\omega$  the angular rotation of the earth,  $r$  the velocity of the wind, and  $\phi$  the latitude of the place.

As it has been already stated, it is an observational fact that on the average the wind at 3,000 ft. does agree with the gradient wind, but it cannot be denied that in each individual case the agreement does not appear to be precise. It seems likely, in view of recent suggestions, that on certain parts of the weather chart the agreement cannot be expected to be precise, but, on the other hand, the discrepancies which appear are such that they may quite reasonably be put down to observational error. Irregularities of pressure occur which are not shown on the weather map, because they are too local to be shown by the barometric data of stations lying one hundred miles or so apart from each other, and it may well be that the gradient wind and the true wind do really agree, but that the former cannot be calculated from the chart with sufficient nicety of detail to make the precise argument plain.

Also, our means of observing the actual wind at 3,000 ft., or other heights, by means of pilot balloons, are not absolutely accurate, since in general they assume a uniform rate of ascent on the part of the balloon, and this is not strictly true.

However, accepting the statement that at the present time the best means of estimating the upper winds is by means of the pressure distribution, and that we may take the records of pilot balloons as reliable, it is of interest to ascertain what accuracy may be expected. Thus, if a pilot is in the air one hour, and has been told that the wind is blowing at the rate of 20 miles an hour from the west, whereas in reality it is only ten, he should find himself 10 miles west of his proper destination. Equally, if the wind's direction had been wrongly estimated by 30°, and it were really 20 miles per hour from 30° north of west (W. 30° N.), he would find himself 10 miles south, and about three west of his landing place. To ascertain what the usual error would be, I have taken the observations on pilot balloon ascents, published by the Meteorological Office in the *Geophysical Journal* for 1915, and compared the actual wind at .5 km., 1.0 km. and 1.5 km. (1,640, 3,281,

4,922 ft.), with the gradient wind deduced from the charts of barometric pressure. There are from 200 to 300 ascents available. In accordance with a common practice in dealing with statistics they have been divided into two groups, January to June and July to December. The results are given in Table III.

TABLE III.

		Group. .5 km. 1.0 km. 1.5 km.		
Probable error in miles per hour of estimated wind ..	I.	4.2	5.0	5.5*
	II.	4.7	5.5	5.2†
Probable error in degrees of direction .. .. .	I.	16°	17°	16°
	II.	16°	13°	12°
Probable error of component perpendicular to inches ..	I.	3.4	4.0	4.0
	II.	4.4	5.1	4.1
Combined probable error ..	I.	5.4	6.4	6.8
	II.	6.5	7.5	6.7
Mean excess of real wind over gradient wind .. ..	I.	.8	3.0	3.6
	II.	.5	2.1	2.0
Mean excess in degrees of direction of real wind over gradient wind. (Positive direction N.-E.-S.-W.) ..	I.	-18°	2°	-1°
	II.	-5°	0°	0°

\* 127 observations.

† 134 observations.

The two groups show a good agreement save in one particular, and also the number of observations is ample. It may be well to explain here the meaning of the term probable error. It is that for any one estimate the chances are equal whether the error made is greater or less than the probable error. The chances are 22 to 1 against an error exceeding three times the probable error, and 142 to 1 against exceeding four times. The discrepancy in the mean angle of the real wind with the isobar, -18° for the first half-year and -5° for the second, seems to be due to an excess of easterly winds in the first half as east and south-east winds often have a large incurvature.

The chief point in the table for our purpose is the magnitude of the combined error. Suppose a balloon adjusted to float at 3,000 ft. for one hour, and that we wished to foretell its position at the end of the hour by means of the isobaric chart. There are two errors concerned, one in the line of the isobar owing to a wrong estimate of the velocity and one at right angles to this, owing to a wrong estimate of the direction. These are probably independent, and, therefore, the combined error is the square root of the sum of the squares. This would not be true for cases where the gradient wind is zero or very small, but such cases are not numerous enough to seriously alter the result. Thus, taking the supposed case of the balloon, and this is strictly analogous to a pilot flying without the use of landmarks, if the position be plotted by an isobaric chart, and then a circle be drawn of seven miles radius with that position as centre, in about half the cases the balloon would lie within that circle at the end of the hour, and in about half without. This does not, of course, include any difficulties about the compass.

For two hours the error would be doubled, for three hours trebled, and so on, but as the length of flight increases other considerations come into play which we must consider. For a long flight the estimate of the wind to be allowed for depends upon the weather chart, as it will be some hours hence, and not as it is at the time, thus involving the necessity for forecasting the chart. I do not propose to enter into this point, beyond saying that it must increase the error. Further, any error in the earlier part of the course of the aeroplane would bring it into an unanticipated position, both in place and time, in the latter part, and this again increases the probable error. These are both disadvantages. But there is another respect in which a long flight may possibly have the advantage. It may perhaps be that the discrepancies shown between the gradient wind and the wind as deduced from the ascent of a pilot balloon are merely local and temporary, and that the error when integrated over a long course may very largely cancel out. Whether this is the case or not, the future will show. My own opinion rather is that a probable error of from 5 to 10 miles for each hour in the drift of an aeroplane will



have to be reckoned with for some time to come, though, doubtless, the error will decrease with time and experience.

There is the possibility of a systematic error in some of the values of Table III. The results are not published unless the pilot balloon is followed up to a height of at least 2.5 km. Other things being equal, this is more likely to happen when the wind is decreasing than when it is increasing above. Since a pilot balloon under 3 km. is generally lost sight of behind a cloud rather than by getting too far away, the error so caused is probably small.

The table is only carried to 1.5 km.; for greater heights the probable error of the drift increases, but the systematic error mentioned above will become more and more effective, and it is very doubtful if anything worthy of the name of an estimate can be made from the pressure distribution for heights over 15,000 ft.

**Thunderstorms.**—The dangers due to thunderstorms are mentioned by Captain Cave in the paper already referred to (Vol. XXI., page 301), and it is a point on which further information is much to be desired. There can be no doubt that in some thunderstorms very violent air currents occur; this is apparent from the motion of patches of cloud. From theoretical considerations also it is probable that strong ascending currents of air are to be found in some part of every storm, but in many storms no clouds that can be seen show any violent motion. There is also the danger that the aeroplane may form part of the path of a lightning flash. Most likely the great majority of flashes follow a more or less horizontal path from cloud to cloud and it seems inevitable that an aeroplane near the perspective path should carry part of the discharge. Still the risk cannot be nearly so great as in the case of a kite or captive balloon connected to the ground by a metal wire.

## QUESTIONS IN PARLIAMENT.

### Air Forces (Wounded Officers).

**Mr. BILLING** on December 13th asked the Under-Secretary of State for War whether he is aware that flying officers wounded in the air who succeed in getting their machines back safely to the aerodromes are only allowed three months' flying pay, while officers who crash their machines are allowed flying pay up to six months; and whether he will have this anomaly rectified?

**Mr. Forster:** This question is already under consideration.

### Air Council.

**Mr. BILLING**, on December 17th, asked the Prime Minister whether he can now state the names and constitution of the new Air Council?

**Mr. Bonar Law:** I cannot as yet give the information asked for.

**Mr. Billing:** Will the right hon. gentleman be able to give it before the Adjournment?

**Mr. Bonar Law:** I am afraid not. The appointments have not all been made.

### Aerodrome Sites.

**Mr. BILLING**, on December 18th, asked the Prime Minister whether he will call on the Admiralty, the War Office, the Air Board, and any other Departments interested, for a Report on the number of landing-places and sites for aerodromes which have been taken over by these various Departments and subsequently discarded; whether he is aware that it has been the practice for a single official with no knowledge of agriculture or afforestation or the requirements of the Food Production Department to commandeer vast tracts of land for this purpose; and whether he will instruct the Departments concerned that in future they will employ, for the purpose of commandeering these sites, a properly constituted committee, who shall inspect the sites before the same are commandeered, and which shall include representatives from the Food Production Department, the Board of Agriculture, the Air Board, and at least one pilot who is experienced in night flying?

**Mr. Bonar Law:** The answer to the first and second parts of the question is in the negative. With regard to the last part of the question, proposals are being drawn up for the creation of a Department under the new Air Ministry which will undertake the whole of the work hitherto done in connection with the selection of landing-places and aerodromes by the Royal Flying Corps and the Royal Naval Air Service. I may add that as regards the Admiralty, the practice has been that before a decision is taken to commandeer a site representatives of the Departments referred to by the hon. member are asked for an expression of their views. As regards the War Office, suitably constituted committees have inspected the sites before deciding to requisition them, and the

The ordinary thunderstorm, apart from the line squall variety, does not cover a great extent of country, neither, as a rule, does it travel very fast, and there is little doubt that an aeroplane could avoid it. But it would probably be dangerous to try to pass over it. The difficulty seems to me to be to recognise a thunderstorm as such.

Of all meteorological phenomena thunder is perhaps the easiest to foretell without the use of instruments, for, as many of us have noticed, thunder clouds have a very distinctive appearance that a good observer may learn to recognise. A really fine thunder cloud, with its sharp edges, and strongly-defined contrasts of colour is unmistakable, but such a cloud passes by many graduations into the soft harmless summer cumulus, and no precise line can be drawn as to where the one ends and the other begins. Mere blackness in a bank of clouds does not denote thunder, sharpness of edge is the characteristic sign. Blackness is sometimes merely the effect of contrast, and may appear in a sheet of fine weather stratus cloud when the sun is low down on the opposite side of the sky. If the upper edges of a bank of clouds are soft and fleecy, it is almost certain that while that condition holds no thunder will occur. I exclude from my meaning of "soft and fleecy" the false cirrus that so often grows from the top of a cumulus, and which has an unmistakable appearance of its own. On the other hand, if the upper part has well-defined sharp edges, it is, in the summer at least, not improbable that thunder will follow. But while I think it possible to separate most days into two classes, those in which thunder is likely and those in which it is very improbable, I do not think it is possible to define from its appearance any cloud or bank of clouds as one in which thunder will or will not occur within the next half-hour.

It is superfluous for me to repeat Captain Cave's remarks about the line squall.

requirements of food production and agriculture have invariably been considered before land is taken up.

**Mr. Billing:** Is the right hon. gentleman aware that there has been a waste of some hundreds of acres of corn and that some £100,000 has been squandered by this more or less reckless commandeering; will he see that the commandeering is not done by individuals, but by a committee on the spot; and is he aware that the present method is for an individual to report and a committee to give a decision without the least knowledge, as they base their decision entirely on a report?

**Mr. Bonar Law:** As regards the hon. member's statement of facts, perhaps he will give me particulars. The present method is to appoint a committee which will have the whole responsibility.

**Mr. Billing:** Will the right hon. gentleman say that the committee shall visit the sites, and not merely receive reports upon them?

**Mr. Bonar Law:** The object of appointing a committee is to make sure that the harm to which the hon. member refers is not done. I am sure that the Committee will take whatever steps are necessary to secure that end.

### Air Force Uniform.

**Mr. Billing** asked the Parliamentary Secretary to the Air Board what uniform allowance, if any, is to be made to officers of the Royal Flying Corps and Royal Naval Air Service, respectively, for the new Air Service uniform; and whether any day has been proposed for the formal introduction of this new uniform?

The Parliamentary Secretary to the Air Board (Major Baird): As regards the first part of the question, I am not in a position to add anything to the answer which I gave to a similar question by the hon. member on the 3rd inst. The answer to the second part of the question is in the negative.

**Mr. Billing:** Is the hon. and gallant gentleman aware that he has never stated yet whether it is the intention to make an allowance for this uniform to the officers in question? In view of the fact that some have already had to change their uniforms once at the will of the authorities and received no payment for it, is it proposed to ask them to change it again and make no allowance?

**Major Baird:** I did not say it was not proposed to make any allowance. I said the position is not yet settled. There are a great many things more urgent than the question of uniform.

**Mr. Billing:** There may be more urgent questions, but these orders have been given, and the officers want to know where they stand, and that is essentially an urgent matter.

**Major Baird:** No orders have been given of any sort or kind.

**Mr. Billing:** It is time they were.

### The Work and Training of the R.N.A.S.

WHEN "The Work and Training of the R.F.C." was produced recently, a companion book for the R.N.A.S. was promised. It has now made its appearance, and is even more interesting than its predecessor. The photographs are more up to date—most of them have never seen the light of publicity before—and they have been selected with a keener eye for incident. There is a group of photographs of the rescue of a seaplane pilot, whose machine hung itself 300 feet up a wireless mast; there is a splendid picture of a machine in the act of looping; while another one gives a graphic idea of what happens when a bomb bursts. These are but a few of the many photographs illustrating various activities of the R.N.A.S. As in the book of the R.F.C., there are a number of photographs illustrating the training of pilots and men for the R.N.A.S., and all the pictures are

reproduced in photogravure, for which process the Illustrated London News and Sketch, Ltd., the printers, are famous. As before, the price of the book is 2s. 6d. net.

### For the Young Idea.

A REAL chance, for the younger generation, of combining enjoyment with instruction offers itself on January 2nd, when, under the auspices of the Aeronautical Society, Dr. A. P. Thurston will give a "Juvenile lecture" at the Grafton Galleries, Grafton Street, London W., on "The Aeroplane." Lieut.-Col. Mervyn O'Gorman will preside at the lecture, which will be illustrated by cinematograph films, lantern slides, models and experiments. The lecture has been arranged for children, of members of the Aeronautical Society, and their friends, and tickets can be obtained from the Hon. Secretary at 7, Albemarle Street, W.



# PARISMS FROM THE FOUR WINDS

A GOOD move has been commenced at the East London College, University of London, in the inauguration of a preliminary course in science and engineering for young men between 17 and 18 years of age, desirous of entering the Air Force. The course is not intended to take the place of the practical training provided by the Government, but to ensure that those who desire to be admitted to the Air Force should, when admitted, be in a position to benefit properly by the instruction provided by the Government. The course includes aeronautics, physics, electrical engineering, applied mechanics and engineering, drawing, and aeroplane engines.

AFTER the highly successful Tank War-Bonds, why not an Aeroplane War-Bond week? There must be quite a number of interesting machines, each of which could tell its own tale.

SUCH parts of wrecked German aeroplanes, brought down in England and at the front, as are not required for our own technical purposes, are now being converted into souvenirs, by disabled soldiers and sailors at the Lord Roberts Memorial Workshops. The souvenirs take the form of many useful articles—paper weights, cigar ash trays, clocks, dinner-gongs, walking sticks, and trinket-boxes. They will shortly be on sale in West-end shops. Each article bears on a small metal tablet the words, "Fragment from a German Aeroplane," and also a certificate of authenticity. The proceeds will be devoted to the Royal Flying Corps Hospital, and the Lord Roberts Memorial Workshops.

THE other day, at the Thames Police Court, one Davis Beigel, a hairdresser, of Leman Street, Whitechapel, was fined £25 for failing to shade his light. How is it that nine out of ten of these transgressors answer to such aggressively Scotch names?

It's a good job magistrates do not regard "disturbance of mind" air raids as sufficient excuse for shoplifting. Such was the ingenious plea put forward last week, by a young

thing of 65, to Mr. Banks, K.C., the stipendiary at the South Western Police Court, who was not altogether discouraging, as he was satisfied with binding over the delinquent.

BROADSTAIRS Council are dissatisfied with the Government compensation scheme for air raid damage recently announced. They still hold that the State should bear the entire responsibility to indemnify sufferers.

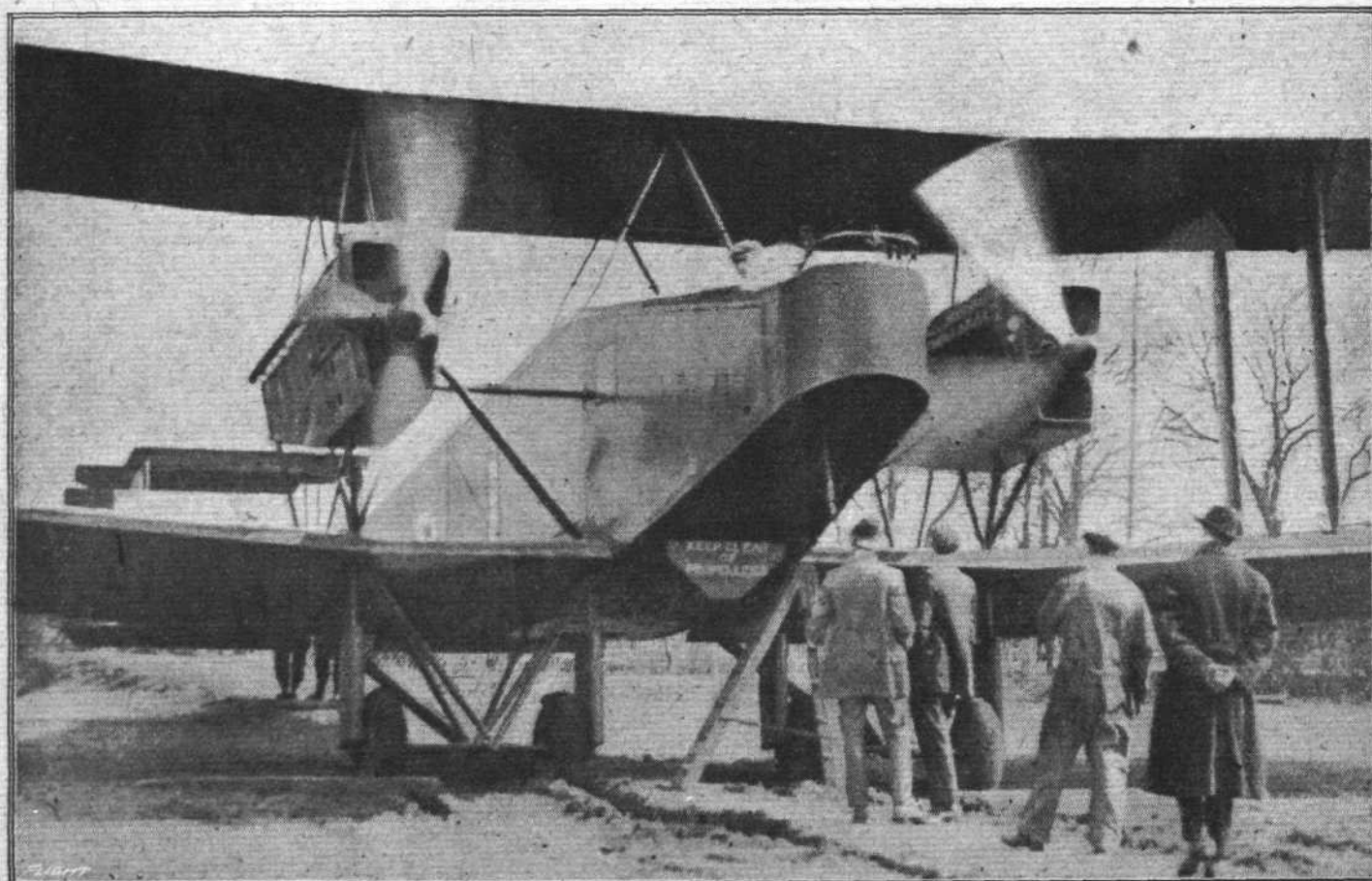
It would be interesting to know under what formula the three shilling bonus result was arrived at by Broadstairs' neighbour, Ramsgate, for remunerating its police for any week in which they are called for air-raid duties.

ANOTHER military object achieved by the Hun raiders. Leaving his house on the morning of the last air raid, to take cover in a friend's basement, John Henry Samuel, 76, of Islington, died from shock.

FOUR fighting planes which Mr. James Carruthers, one of the most influential grain dealers in Canada, some little time back presented to the War Office are to bear the names Toronto, Montreal, Winnipeg and Edmonton. Mr. Carruthers, who is President of the Canada Steamship Lines, is particularly well known in the cities which the war-planes will represent.

A BILL has been introduced at Washington permitting women to enlist and receive commissions in the Aviation Section of the U.S. Signal Corps. Only those between the ages of 18 and 35 will be eligible.

HENDON has aviation in a measure to thank for helping the abnormal development of recent years, whereby the population having now grown to over 50,000, it has been recognised by the Middlesex County Council as entitled to increased representation on the District Council, as also the Board of Guardians, by two and four members respectively.



**TESTING THE ENGINES.**—The two Rolls-Royce engines on the "H.P." having a trial run before the start on the London-Constantinople bombing expedition.



FATHER BERNARD VAUGHAN is a believer in the aeroplane as one of the determining factors in winning the war. Recently after a camp lecture on "The War and How to Win it," Father Vaughan sampled an air "joy-ride."

For some time it has been patent that German air-ship officers have imagination, as may be judged by some of the descriptive matter which has from time to time purported to record the result of their visits to London. One Zeppelin officer has now gone a step further and executed some paintings depicting his air-raids over the metropolis, the *Berliner Illustrierte Zeitung* being responsible for their reproduction for the delectation of the Hunnish public.

FROM "a Londoner's Diary": "A Message from the Air. A member of the Royal Flying Corps, who is a prisoner of war in Germany, has a sister who is employed in a London newspaper office. The other day she received an unstamped letter from him, the envelope being discoloured by mud. It was picked up in one of the East End districts, and had been dropped by a German airman in the course of a recent raid!"

LIEUT. C. F. ALSTON, R.F.C., who has had some pretty weird experiences out yonder, when in the air, has summed up, very tersely, the type of recruit the Air Force hankers after. Thus Lieut. Alston: "We want the true British sort of spirit—the sort of fellow who will go straight for his man; the good Rugby footballer not afraid to tackle. The ordinary scrap last three or four minutes, and the usual way of starting is that you see your opponent and go straight at him. He will be firing at you all the time, but as long as you both go straight your engines, being in front, will save you. Of course, if you both go straight there will be a collision and you will both go down. Never mind that. Go straight. Experience shows that in 100 cases out of 102 it is the German who will be the first to turn, and then he offers a good mark. That is the sort of fellow we want—the one who will go straight."

LUCKILY we've already got plenty with this sort of push about them, but the Force cannot have too many of them. Those who feel inspired by the above should just send their names along to the nearest Recruiting Officer.

If all folk who deplore Lord Lansdowne's very unfortunate letter were to protest in the same form as Mr. Ash-

worth Hope has done, the ill-judged publication of this document in the *Daily Telegraph* might almost turn out a blessing in disguise. Mr. Hope, who is a writer of popular songs, has, through the publishers of his latest effort, Messrs. Gould & Boittler, of Poland Street, sent a telegram, dated from Ipoh, Malay States, stating that he has presented a battle-plane to the War Office as a protest against Lord Lansdowne's unpatriotic letter. In the *Daily Telegraph*, where the telegram is published in the advertisement columns, an alternative to the example set by Mr. Hope is suggested to the effect: "If you cannot present a battle-plane Buy War Bonds; Do it To-Day, Lest you forget!"

EIGHTY million acres of silver spruce and balsam fir forests are still available in Canada for use, the former particularly for the manufacture of aeroplanes. As this should probably be about enough to see this war through, by the way it is going on at present, the prohibition of its export to all places outside the British Empire, except under licence, has been promulgated just in the nick of time.

MR. BAKER, the American Secretary of War, is re-assuringly confident, in a recent report, in regard to the military situation in the West, and incidentally mentions as a fact that the aerial raiding of German towns, by way of reprisals for the Hun's iniquities against Allied open towns, has been successfully initiated. It is comforting to be able to publish this announcement in advance of any particulars upon the subject from our own authorities which may presently be permitted to transpire.

EXPRESSIONS of unqualified approval of Lord Rothermere's decided resolve to give rein to reprisal organisation are in evidence practically without a dissentient. A more formal acknowledgment has been accorded the Air Minister by the League of Londoners, who last week at a meeting in the Central Hall, Westminster, Mr. Cuthbert Wilkinson, L.C.C., presiding, decided, on the proposal of Colonel Sydney Ashley, to send a resolution of congratulation to Lord Rothermere, "on his outspoken, courageous, and emphatic speech on the question of air raid reprisals on Germany, after the postponement of promises hitherto made, but apparently without fulfilment."

Mr. Edwin Evans, a member of the London County Council, urged that the object of the League should be to eliminate all danger at home from "Bolos, peacemongers, pamphlet-pushers, 'Cuthberts,' and grousters who went about everywhere telling most blood-curdling stories, which had no foundation in fact."

How far misrepresentation of facts can go when the view expressed suits the book of the propagandist handling the "facts," was well exemplified the other day in the House of Commons when Brigadier-General Croft called attention to some comments in the *Labour Leader* of December 6th, in connection with an appeal for toys for the children in Elizabeth Hospital, it being therein alleged that some of the bombs which wounded little children belonged to the Allies. Sir George Cave's reply was: "I have read the statement referred to. If the writer meant to suggest that any of the children in the Elizabeth Hospital at Poperinghe were injured by bombs dropped by the Allies he was, of course, making a deliberate misstatement. But if he intended only to suggest that Belgian children may have suffered by the bombardment of places of military importance in Belgium, he was making an assertion which cannot yet be either proved or disproved; and in view of the ambiguity of the paragraph I do not think that proceedings could be taken in respect of it. I would, however, point out that while we have endured for three years the wilful and deliberate attacks by the Germans on the civil population, including women and children, the whole country is aware that the Royal Flying Corps in their attacks on the enemy's strongholds in Belgium have done their utmost to avoid injury to the Belgian inhabitants."

ACCORDING to the Paris correspondent of the *Daily Mail* the Greek Minister of Marine has authorised the engagement as a seaplane pilot of Mlle. Denise Kalimeri, daughter of a Government engineer. She is to undergo immediately examination in flying, before being appointed to the Marine Corps.

M. LASIES, a French Deputy, has been giving a forecast to the *Matin*, upon the last battle of the war, which he suggests will be one day next spring, in the air. He explains that in this unexampled duel, in addition to aeroplanes, machine guns, and pilots, all the industrial energy and brain-power of the belligerents will be opposed. What form will the battle take? Either one of immense offensives on land, in which





airmen will play a preponderating part, or else, instead of flying corps against flying corps, there will be attacks on towns, stations, factories, and depôts behind the lines. Sacrifices, he contends, we must make, for the vital need of air supremacy cannot be too strongly urged. We are now passing through the last moments in which our efforts can influence the decisive hours of the first fine days.

OVER £10 in farthings has been collected amongst the poor at Limehouse to go towards the provision of a motor-ambulance for air-raid work. Thus is the fame of the Kaiser spread amongst the lowliest of London's inhabitants.

WITH their usual ingenuity, the R.F.C. this week, when the frost came, quickly evolved a sledge out of old aeroplane runners and displayed their prowess at tobogganing on the hill slopes at Orpington and Biggin Hill, a number of convalescent soldiers being amongst those who enjoyed the sport.

IN the very remarkable series of clauses embodied in the terms of the Russian-German armistice published last week, provision is made for controlling aerial enterprise. Article VI says that in order to avoid unrest and incidents at the front no operations may be undertaken for 10 miles behind the fronts. A 6-mile zone behind each side's own demarcation lines applies for the aerial forces.

SERIOUS precautions against expected attacks by great British and American air squadrons, says the Dutch newspaper *Työl*, are being taken by Cologne, and other Rhenish and Westphalian towns. New anti-aircraft guns have been installed and bomb-proof shelters built. The population has also received new instructions for safety.

IN this connection the following regulations, which have evidence in them of the taking advantage of wisdom begotten of experience, as a result of the Hun air-pirates' attack upon British cities, are the latest issued by the German authorities:—

"THE military authorities again draw attention to the fact that the darkening of windows, &c., is not yet carried out in a satisfactory manner.

"The object of shading all sources of light is to make it impossible for enemy aircraft to take their bearings during their flight, and to make it more difficult for them to drop bombs on localities where they could do damage.

"As a matter of fact the complete darkening of towns near the Western front, which has been carried out in accordance with the regulations, has been so successful that many flyers have so completely lost their bearings as to land within our lines, while on the other hand bombs have been dropped repeatedly on localities of no military or commercial value whatever, simply because they were brilliantly illuminated.

"The lighting regulations are therefore a protection to the individual as well as to the masses.

"Particularly reprehensible is the habit of turning on lights during an air attack, without first properly shading the source of light.

"The police now have instructions to see that the regulations are carried out to the letter, and those offending will be dealt with with the utmost rigour of the law.

"The following are considered to be efficient means of darkening for private houses and business premises:—

"Closing up windows, doors, &c. by means of fixed or roll

shutters; covering windows, &c., with a coat of paint or by hanging blinds, curtains, &c., made of material or paper in such a manner that the number of lights is not discernible from outside; shading the source of light itself by means of cardboard shades, thick paper, &c., in such a manner that the direct rays of light do not fall upon the windows or doors.

"It is to be hoped that the patriotism of our fellow-citizens will induce them to put up with the inconvenience of shading their lights in the manners indicated without murmur, and thus avoid the necessity of police action being taken against offenders.

"In conclusion, it is again urgently requested that private individuals should refrain from using the telephone during or immediately after an air raid, more especially in respect to making inquiries from the post office or other public buildings regarding the progress of the raid.

"Officials have instructions not to answer such inquiries, as they only endanger the necessary official telephoning.

"In response to an urgent demand on the part of the public, it has been decided to notify the all-clear after a raid by blasts on a siren. As soon as the necessary arrangements in this direction have been made the details will be published.

"F. H."

## TEN YEARS AGO.

Excerpts from the "Auto," ("FLIGHT's" precursor and sister journal of December 14th, 1907. "FLIGHT" was founded in 1908.

### THE BLÉRIOT AEROPLANE.

The fates are apparently now kinder to M. Blériot, and he, on December 7th was successful in making two or three very good flights, the first of which was a semi-circular course of about 160 yards, the second a straight flight of about 600 yards, and the third another straight flight of about 500 yards.

### THE FARMAN AEROPLANE.

On Friday of last week Mr. Farman's aeroplane met with a mishap, which occurred, however, while it was being taken out for trial, and not during the course of an actual flight. The machine toppled over, apparently as the result of recent alterations resulting in the lightening of the tail, and the damage caused to the framework was somewhat considerable.

### DE MARCAY AIRSHIP.

An airship designed on most original lines has been constructed by the Baron de Marçay in conjunction with M. Kluytmann, who is acting as engineer. Its peculiarity consists in dividing the gas vessel, which is very long, into two entirely distinct sections at the middle, and in mounting the propeller, which is of enormous diameter, in the gap thus provided.

### THE GASTAMBIDE-MENGIN AEROPLANE.

Two other well-known automobilists in France have now come to the fore in the aeronautical world. Messrs. Gastambide and Mengin having combined forces with a view to experimenting with a heavier-than-air machine. It will be equipped with an 8-cylinder 50 h.p. Antoinette engine, which will drive a tractor screw of 2 metres in diameter, and 1.3 metres pitch. The total surface available will be 24 sq. metres, and the weight 350 kilograms. It is anticipated that it should rise at a speed of from 55 to 60 kilos. per hour.

## "X" AIRCRAFT RAIDS.

### "X 85" Raid (December 18th).

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief, Home Forces:—

"December 18th, 9.48 p.m.

"Hostile aeroplanes crossed the Kent and Essex coast about 6.15 p.m. and proceeded towards London. Some of the raiders reached the London district and dropped bombs. Bombs were also dropped in Kent and Essex. Reports of casualties and damage have not yet been received. Our guns and aeroplanes were both in action."

"December 19th, 11 a.m.

"Latest reports indicate that from 16 to 20 enemy aeroplanes took part in last night's air raid. Three groups of raiders crossed the Kent Coast between 6.15 and 6.25 p.m., and three other groups crossed the Essex Coast between 6.10 and 6.45 p.m. All six groups made towards London. Most of the raiders were turned back by gun-fire at various places, only about five machines actually reaching and bombing the capital between 7 and 8 p.m. After the main attack on London had terminated a single aeroplane made its way over the capital about 9 p.m.

"One raider was hit by gunfire and finally came down in the sea off the Kentish Coast, two of its crew of three men

being captured alive by an armed trawler. There is reason to suppose that another enemy aeroplane came down in the Channel, but this is unconfirmed at present.

"One of our pilots attacked and fired two drums of ammunition into a raider as the latter was in the act of dropping bombs on London from a height of 13,000 ft. Another of our pilots also engaged the enemy over London, and a third in the vicinity of the capital at 11,000 ft. All our machines returned safely.

"Full reports of casualties and damage in London have not yet been received. Bombs were also dropped in various places in Kent and Essex."

"December 19th, 12.45 p.m.

"Latest police reports state that 10 persons were killed and 70 injured in London in last night's air raid. Outside London only five persons were injured. Several fires occurred, but the material damage is not serious. No damage was caused to naval or military establishments."

### German Version.

"Berlin, December 19th.

"Our airmen effectively attacked with bombs London, Ramsgate, and Margate."





# The British Air Service

"PER ARDUA AD ASTRA"



UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

Admiralty, December 17th.

**Probationary Flight Officer (Temporary).**—H. Saunders, entered as Prob. Observer Officer (temp.), with original seniority of Oct. 7th.

The following have been entered as Prob. Flight Officers (temp.):—J. E. Gow, G. F. Fountain, C. C. Fisher, G. Dutton, F. J. C. Bush, R. S. C. A. Didwell, and R. H. Barker.

The following have been entered as Prob. Flight Officers (temp.) and all appointed to "President II" for R.N.A.S.—W. R. Reid, H. A. Lye, D. MacDougall, H. J. McLeod, and A. H. Hull.

A. G. Buckham granted temp. commission as Lieut. (R.N.V.R.), seniority Dec. 9th.

Admiralty, December 18th.

The following Prob. Flight Officers have been promoted to rank of Lt. Sub-Lieut., with original seniority:—J. N. Rutter, A. W. Slater, D. V. Carnegie, C. T. Dodd, A. Woods, F. G. H. Hooper, A. D. Reid, A. R. Kelly, G. Dymore-Brown, E. G. Jones, L. Jolly, C. G. Duckworth, J. W. Thompson, and M. F. Oakley.

**Sub-Lieutenant, R.N.V.R. (Temporary).**—J. M. Welshman, entered as Prob. Flight Officer (temp.), seniority Dec. 2nd.

**Signaller (R.N.V.R.).**—I. D. Stewart, entered as Prob. Observer Officer (temp.), seniority Dec. 29th.

**3rd Writer.**—F. Hopwood, entered as Prob. Observer Officer (temp.), seniority Dec. 11th.

G. S. Hall and F. E. Jackson, both granted temp. commissions as Lieut. (R.N.V.R.), seniority respectively Dec. 14th and 17th.

Temp. commissions as Sub-Lieut. (R.N.V.R.) have been granted to H. W. Taylor and R. Hopkin, seniority respectively Dec. 5th and 10th.

Admiralty, December 19th.

The following Prob. Flight Officers (temp.) have been promoted to rank of Lt. Sub-Lieut. (Temp.), with original seniority:—W. A. Ashley, W. S. B. Freer, W. A. Yeulett, M. A. Taylerson, E. V. Bell, C. E. Horrex, G. R. Nodwell, J. R. F. Randell, G. E. Taylor, K. H. G. Tilley, H. Sutherland, L. P. Coombes, A. S. Graves, A. H. C. Randall, F. Kemp, A. L. Jones, A. P. Stock, H. M. O'Loughlin, P. A. Marriott, H. A. Patey, M. H. Bailey, H. S. Eaton, G. R. Ashton, J. H. Curtis, A. J. O. Farina, E. P. O. Haughton, J. W. G. Price, L. M. Hilton, E. G. Rice, G. B. Gates, L. Latham, J. C. G. Macdonald, J. H. Cauldell, R. E. Wallis, G. R. J. Parkinson, L. C. Bower, D. C. S. Bland, D. M. Allen, C. E. Wodehouse, L. B. Ransford, E. H. Wells, S. J. Chamberlain, R. I. Kirkland, R. E. Burr, F. C. Sherwood, P. Smallwood, and C. L. Fraser.

**Probationary Flight Officers (Temporary).**—D. E. Spalton and A. Boyd, entered as Prob. Observer Officers (temp.), seniority Oct. 7th.

The following have been entered as Prob. Flight Officers (temp.):—G. E. Sands, W. C. Willdey, W. G. Wheatland, P. R. Clare, W. H. R. Lukey, C. R. Moore, E. B. Marquick, R. H. Rose, K. Stuart-Smith, M. Whitehead, C. H. Coggins, R. Henderson, K. G. Brabner, and F. N. P. Ritchie.

Mr. A. G. V. Reeves entered as Prob. Observer Officer (temp.), seniority Dec. 29th.

Temp. commissions (R.N.V.R.) have been granted to the following:—Lieut. T. le gee Pynches. Sub-Lieuts.—W. T. Kanaar, E. H. Watson, L. D. Stuart, and F. Begley.

## Royal Flying Corps (Military Wing).

London Gazette Supplement, December 17th.

The following temp. appointments are made at the War Office:—**Staff Lieutenant.**—2nd Lieut. (Hon. Capt.) A. V. Hambro, (T.F.), Res., from an Equipment Officer, 2nd Cl., R.F.C.; Dec. 1st.

The following appointments are made:—

**Wing Commanders.**—From Sqdn. Comdrs., and to be Temp. Lieut.-Cols. whilst so employed:—Capt. (Temp. Major) F. H. Jenkins, M.C., S.R.; Sept. 15th. Major L. Jenkins, M.C., R.G.A. (T.F.); Nov. 22nd. Major J. R. C. Heathcote, Cam'n. Highrs.; Nov. 26th.

**Flight Commanders.**—From Flying Officers, and to be Temp. Capts. whilst so employed:—Temp. Lieut. R. L. Stevenson, Gen. List; Temp. 2nd Lieut. (Temp. Lieut.) F. J. Woodard, Gen. List; Dec. 4th.

**Flying Officers.**—2nd Lieut. H. E. Hastie, High. L.I., S.R., and to be sec'd.; Sept. 14th. Temp. 2nd Lieut. D. P. Cameron, Gen. List; Sept. 20th. Lieut. A. P. Maclean, R. Scots (T.F.), and to be sec'd.; Oct. 26th. 2nd Lieut. A. L. Seddon, Lond. R. (T.F.), and to be sec'd.; Oct. 5th. Temp. 2nd Lieut. R. V. Nalder, Gen. List, from a Flying Officer (Ob.); Oct. 14th, seniority Oct. 3rd, 1916. 2nd Lieut. J. R. Foster, Yeo. (T.F.), and to be sec'd.; Oct. 19th. 2nd Lieut. C. D. Bremmer, Yeo. (T.F.), and to be sec'd.; Oct. 25th. Temp. 2nd Lieut. C. Evans, Gen. List; Nov. 18th. Capt. M. L. Doyle, Canadian Exped. Force; Nov. 27th. 2nd Lieut. J. A. Percy, Yeo. (T.F.), and to be sec'd.; Nov. 28th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. T. K. Shipwright; June 4th. L. W. Flynn, V. Voss; Oct. 16th. D. G. Scott; Nov. 3rd. J. R. Fullarton, A. E. Bingham, A. Crozier, W. Hewby, J. Craig; Nov. 23rd. F. J. L. Bishop, C. B. Turner; Nov. 29th.

**Equipment Officers, 1st Class.**—Capt. L. S. B. Hull, R.W. Surr, R. (T.F.), from 2nd Cl.; Oct. 22nd. From 2nd Cl., and to be Temp. Capts. whilst so employed:—Lieut. L. H. B. Cosway, S.R.; 2nd Lieuts. (Temp. Lieuts.), S.R.:—T. G. MacKenzie, A. C. Smith, R. Donald, J. D. Campion; Dec. 1st. Temp. 2nd Lieut. (Temp. Lieut.) J. P. Angell, Gen. List. 2nd Cl.—From 3rd Cl., and to be Temp. Lieuts. whilst so employed:—Temp. 2nd Lieut. S. Crowther, Gen. List; Nov. 3rd. Temp. 2nd Lieut. H. Howard, Gen. List; Nov. 10th. Temp. Lieut. G. Osmand, Gen. List, from a Flying Officer; Nov. 20th. Temp. Lieut. C. W. Jamieson, Gen. List, from 3rd Cl.; Nov. 21st. 2nd Lieut. A. R. Jones, S.R., from a Flying Officer; Nov. 23rd. Temp. 2nd Lieut. C. J. Strother, Gen. List, from 3rd Cl.; Dec. 10th. 3rd Cl.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. H. Turner, R. B. Winyard; Oct. 20th. F. V. Harrap, F. M. Roberts; Nov. 12th. G. J. Finley; Nov. 16th. G. Bowden, H. Dixon, W. J. Hollis, F. T. Holmes, J. H. Lytle, F. V. Ruston, W. E. Langton, J. H. M. Stevenson; Nov. 21st. R. D. Owen, B. Finnigan, N. D. Bryce; Nov. 24th. O. Charlton, E. W. S. Jacobi; Nov. 28th.

Schools of Military Aeronautics.

**Assistant Instructors (graded as Equipment Officers, 2nd Class).**—Temp. 2nd Lieut. P. C. Hollingsworth, M.C., Gen. List, a Flying Officer (Ob.), and to be Temp. Lieut. whilst so employed; Aug. 29th. Appointment of Lieut. A. Hollingsworth, Canadian Local Forces, notified in Gazette of Nov. 27th, is cancelled.

Schools of Instruction—Wireless School.

**Commandant (graded as a Depot Commander).**—Capt. (Temp. Major) J. B. Bowen, Yeo. (T.F.), from a Comdt. (graded as a Park Comdr.), School of Wireless Operators, and to be Temp. Lieut.-Col. whilst so employed; Oct. 12th.

Balloon Schools of Instruction.

**Commandant (graded as a Squadron Commander).**—Lieut. (Temp. Capt.) G. S. Sansom, M.C., S.R., a Balloon Co. Comdr. (graded as a Flight Comdr.), and to be Temp. Major whilst so employed, vice Temp. Major A. H. Parker, M.C., Gen. List; Nov. 24th.

School of Inspection.

**Commandant (graded as a Park Commander).**—2nd Lieut. (Temp. Capt.) C. H. Stevens, S.R., an Equipment Officer, 1st Cl., and to be Temp. Major whilst so employed; Nov. 21st.

School of Technical Training.

**Chief Instructor (Technical Section, graded as a Park Commander).**—Lieut. (Temp. Major) V. W. Eyre, S.R., from a Special Appointment (graded as a Park Comdr.), and to retain his temp. rank whilst so employed; Nov. 21st.

**General List.**—Temp. 2nd Lieut. E. P. Crossen to be Temp. Lieut.; Nov. 27th. Temp. 2nd Lieut. J. Cann-Lippincott resigns his commission; Dec. 18th.

**Supplementary to Regular Corps.**—Lieut. F. H. C. O'Beirne resigns his commission on account of physical unsuitability as a Pilot or Observer; Dec. 18th.

London Gazette Supplement, December 18th.

The following temp. appointments are made at the War Office:—

**Staff Lieutenants.**—2nd Lieut. T. D. Bucknill, R.F.C., S.R., from an Equipment Officer, 3rd Cl.; Sept. 28th.

**General List.**—A. R. M. Carse, late Australian Imperial Force, to be Temp. 2nd Lieut.; Dec. 11th.

London Gazette Supplement, December 19th.

**Staff Officer, 2nd Class (graded for pay as a Brigadier-Major).**—The appointment of Lieut. (Temp. Capt.) C. E. Wardle, R.F.C., S.R., is post-dated to Nov. 1st.

The following appointments are made:—

**Wing Commander.**—Capt. (Temp. Major) A. Shekleton, R. Muns. Fus., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Nov. 21st.

**Squadron Commanders.**—Capt. (Temp. Lieut.-Col.) C. F. Lee, Yeo. (T.F.), a Staff Offr., 1st Cl. (graded as an A.A.G.), and to retain his temp. rank (but without pay or allowances of that rank) whilst specially employed; Nov. 17th. Lieut. (Temp. Capt.) F. W. Stent, S.R., from a Flight Comdr., and to be Temp. Major whilst so employed; Nov. 21st.

**Flight Commanders.**—From Flying Officers:—Lieut. E. Y. Hughes, R.F.A. (T.F.), and to be Temp. Capt. whilst so employed; Nov. 40th. Capt. B. U. S. Cripps, M.C., Welsh R.; and to be Temp. Capts. whilst so employed:—Lieut. R. Hilton, M.C., R.A.; Temp. 2nd Lieut. (Temp. Lieut.) G. F. W. Zimmer, Gen. List; Lieut. F. J. Watts, Essex R. (T.F.); 2nd Lieut. H. L. Tracy, S.R.; Dec. 2nd. 2nd Lieut. S. J. Schooley, S.R.; Dec. 3rd.

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.), Gen. List and to be confirmed in their rank:—A. F. Lingard, L. C. Galloway; Nov. 22nd. R. Watson, E. W. Barry, R. E. Robb; Nov. 23rd. L. Gowsell, M. G. S. Burger; Nov. 28th.

**Balloon Wing Commander.**—Capt. (Temp. Major) F. M. Roxby, N. Staff. R., S.R., from a Balloon Co. Comdr. (graded as a Sqdn. Comdr.) and to be Temp. Lieut.-Col. whilst so employed; Nov. 1st.

**Adjutant.**—The appointment of 2nd Lieut. (Temp. Capt.) J. T. Pym, E. Surr. R., S.R., notified in Gazette of Sept. 24th, is antedated to July 30th.

**Special Appointments (graded as Equipment Officers, 1st Class).**—From graded as Equipment Officers, 2nd Cl.; Oct. 15th:—Temp. Capt. G. A. Scott, Essex R.; and to be Temp. Capts. while so employed:—2nd Lieut. (Temp. Lieut.) A. G. Saxty, Som. L.I. (T.F.); 2nd Lieut. (Temp. Lieut.) C. D. Kershaw, W. Rid. R., S.R.

**Equipment Officers, 2nd Class.**—From 3rd Cl. (Dec. 1st):—Lieut. C. Cadman, Yeo. (T.F.); and to be Temp. Lieuts while so employed:—2nd Lieut. H. H. Greig, Res. of Off.; 2nd Lieut. F. E. Hobbey, S.R.; 2nd Lieut. H. G. Welsford, S.R.; 2nd Lieut. T. Moor, S.R.; 2nd Lieut. A. H. Prior, S.R.; Temp. 2nd Lieut. T. J. Owen, Gen. List; Temp. 2nd Lieut. L. D. Brown, Gen. List; Temp. 2nd Lieut. S. Williamson, Gen. List.

**3rd Class.**—2nd Lieut. A. E. Barbe, High. L.I. (T.F.), and to be sec'd.; July 1st. 2nd Lieut. J. H. Falconer, A. Cyclist Corps (T.F.), and to be sec'd.; Nov. 27th. 2nd Lieut. J. C. Lathan, Linc. R. (T.F.); Nov. 29th. 2nd Lieut. L. S. Smith, N. Staffs. R., S.R.; Nov. 30th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. Hawkins; July 1st. J. M. Moore, T. Harris, H. C. King; Oct. 12th. F. M. Burr, I. Bawden, J. K. Bell, A. R. Morrison, J. E. Tyrrell, W. F. Bates, L. M. Britten, C. L. G. Colebrook, J. R. Coulthard, P. L. Hill, O. N. H. Watson, D. F. Winch; Nov. 21st.

Schools of Instruction. Armament School.

**Commandant (graded as a Wing Commander).**—Capt. (Temp. Lieut.-Col.) A. C. H. MacLean, R. Scots, from Comdt., Central Flying School, and to be Temp. Col. while so employed; Nov. 21st.

**Assistant Commandant (graded as a Depot Commander).**—Capt. (Temp. Major) A. C. Bishop, Yeo. (T.F.), from a Comdt. (graded as a Park Comdr.), and to be Temp. Lieut.-Col. while so employed; Nov. 21st.

**Chief Instructor in Gunnery (graded as a Park Commander).**—Lieut. (Temp. Capt.) G. E. Smith, E. Yorks. R., from an Instructor in Gunnery (graded as an Equipment Officer, 1st Cl.), and to be Temp. Major while so employed; Nov. 21st.

**Camp Commandant (graded as a Park Commander).**—Capt. T. B. Hornblower, R. Suss. R. (T.F.), from an Adjut., and to be Temp. Major while so employed; Nov. 21st.

**General List.**—To be Temp. 2nd Lieuts. (on prob.):—J. C. Wood; Sept. 22nd. J. H. Smith; Oct. 13th. C. Le R. Treleaven; Oct. 27th. Flight-Sgt. W. Higson, from R.F.C.; Nov. 26th. Cdt. J. E. Brance, from R.F.C.; Nov. 28th. J. P. Young; Nov. 29th. \* T. Rivers-Fry, C. J. Aust. F. C. E. Burton; Dec. 3rd.

**Brigade Major.**—Lieut. (Temp. Capt.) W. L. Birch, W. York. R. (T.F.), from a Staff Officer, 3rd Cl. (graded as Staff Capt.), and to retain his temp. rank while so employed; Sept. 15th.

**Memorandum.**—Qr.-Mr.-Sgt. W. C. Ibbott from R.F.C. to be 2nd Lieut. or duty with R.F.C.; Nov. 23rd.

## Aeronautical Inspection Department.

London Gazette Supplement, December 19th.

Temp. Hon. Lieut. A. N. Barnett to be Temp. Hon. Capt. whilst employed as Inspector A.I.D. June 1st.



airmen will play a preponderating part, or else, instead of flying corps against flying corps, there will be attacks on towns, stations, factories, and depôts behind the lines. Sacrifices, he contends, we must make, for the vital need of air supremacy cannot be too strongly urged. We are now passing through the last moments in which our efforts can influence the decisive hours of the first fine days.

OVER £10 in farthings has been collected amongst the poor at Limehouse to go towards the provision of a motor-ambulance for air-raid work. This is the fame of the Kaiser spread amongst the lowliest of London's inhabitants.

WITH their usual ingenuity, the R.F.C. this week, when the frost came, quickly evolved a sledge out of old aeroplane runners and displayed their prowess at tobogganing on the hill slopes at Orpington and Biggin Hill, a number of convalescent soldiers being amongst those who enjoyed the sport.

IN the very remarkable series of clauses embodied in the terms of the Russian-German armistice published last week, provision is made for controlling aerial enterprise. Article VI says that in order to avoid unrest and incidents at the front no operations may be undertaken for 10 miles behind the fronts. A 6-mile zone behind each side's own demarcation lines applies for the aerial forces.

SERIOUS precautions against expected attacks by great British and American air squadrons, says the Dutch newspaper *Tyd*, are being taken by Cologne, and other Rhenish and Westphalian towns. New anti-aircraft guns have been installed and bomb-proof shelters built. The population has also received new instructions for safety.

IN this connection the following regulations, which have evidence in them of the taking advantage of wisdom begotten of experience, as a result of the Hun air-pirates' attack upon British cities, are the latest issued by the German authorities:—

"THE military authorities again draw attention to the fact that the darkening of windows, &c., is not yet carried out in a satisfactory manner.

"The object of shading all sources of light is to make it impossible for enemy aircraft to take their bearings during their flight, and to make it more difficult for them to drop bombs on localities where they could do damage.

"As a matter of fact the complete darkening of towns near the Western front, which has been carried out in accordance with the regulations, has been so successful that many flyers have so completely lost their bearings as to land within our lines, while on the other hand bombs have been dropped repeatedly on localities of no military or commercial value whatever, simply because they were brilliantly illuminated.

"The lighting regulations are therefore a protection to the individual as well as to the masses.

"Particularly reprehensible is the habit of turning on lights during an air attack, without first properly shading the source of light.

"The police now have instructions to see that the regulations are carried out to the letter, and those offending will be dealt with with the utmost rigour of the law.

"The following are considered to be efficient means of darkening for private houses and business premises:—

"Closing up windows, doors, &c. by means of fixed or roll

shutters; covering windows, &c., with a coat of paint or by hanging blinds, curtains, &c., made of material or paper in such a manner that the number of lights is not discernible from outside; shading the source of light itself by means of cardboard shades, thick paper, &c., in such a manner that the direct rays of light do not fall upon the windows or doors.

"It is to be hoped that the patriotism of our fellow-citizens will induce them to put up with the inconvenience of shading their lights in the manners indicated without murmur, and thus avoid the necessity of police action being taken against offenders.

"In conclusion, it is again urgently requested that private individuals should refrain from using the telephone during or immediately after an air raid, more especially in respect to making inquiries from the post office or other public buildings regarding the progress of the raid.

"Officials have instructions not to answer such inquiries, as they only endanger the necessary official telephoning.

"In response to an urgent demand on the part of the public, it has been decided to notify the all-clear after a raid by blasts on a siren. As soon as the necessary arrangements in this direction have been made the details will be published.

"F. H."

## TEN YEARS AGO.

Excerpts from the "Auto," ("FLIGHT's" precursor and sister Journal of December 14th, 1907. "FLIGHT" was founded in 1908.

### THE BLÉRIOT AEROPLANE.

The fates are apparently now kinder to M. Blériot, and he, on December 7th was successful in making two or three very good flights, the first of which was a semi-circular course of about 160 yards, the second a straight flight of about 600 yards, and the third another straight flight of about 500 yards.

### THE FARMAN AEROPLANE.

On Friday of last week Mr. Farman's aeroplane met with a mishap, which occurred, however, while it was being taken out for trial, and not during the course of an actual flight. The machine toppled over, apparently as the result of recent alterations resulting in the lightening of the tail, and the damage caused to the framework was somewhat considerable.

### DE MARCAY AIRSHIP.

An airship designed on most original lines has been constructed by the Baron de Marcay in conjunction with M. Kluytman, who is acting as engineer. Its peculiarity consists in dividing the gas vessel, which is very long, into two entirely distinct sections at the middle, and in mounting the propeller, which is of enormous diameter, in the gap thus provided.

### THE GASTAMBIDE-MENGIN AEROPLANE.

Two other well-known automobilists in France have now come to the fore in the aeronautical world. Messrs. Gastambide and Mengin having combined forces with a view to experimenting with a heavier-than-air machine. It will be equipped with an 8-cylinder 50 h.p. Antoinette engine, which will drive a tractor screw of 2 metres in diameter, and 1.3 metres pitch. The total surface available will be 24 sq. metres, and the weight 350 kilograms. It is anticipated that it should rise at a speed of from 55 to 60 kilos. per hour.

## "X" AIRCRAFT RAIDS.

### "X 85" Raid (December 18th).

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief, Home Forces:—

"December 18th, 9.48 p.m.

"Hostile aeroplanes crossed the Kent and Essex coast about 6.15 p.m. and proceeded towards London. Some of the raiders reached the London district and dropped bombs. Bombs were also dropped in Kent and Essex. Reports of casualties and damage have not yet been received. Our guns and aeroplanes were both in action."

"December 19th, 11 a.m.

"Latest reports indicate that from 16 to 20 enemy aeroplanes took part in last night's air raid. Three groups of raiders crossed the Kent Coast between 6.15 and 6.25 p.m., and three other groups crossed the Essex Coast between 6.10 and 6.45 p.m. All six groups made towards London. Most of the raiders were turned back by gun-fire at various places, only about five machines actually reaching and bombing the capital between 7 and 8 p.m. After the main attack on London had terminated a single aeroplane made its way over the capital about 9 p.m.

"One raider was hit by gunfire and finally came down in the sea off the Kentish Coast, two of its crew of three men

being captured alive by an armed trawler. There is reason to suppose that another enemy aeroplane came down in the Channel, but this is unconfirmed at present.

"One of our pilots attacked and fired two drums of ammunition into a raider as the latter was in the act of dropping bombs on London from a height of 13,000 ft. Another of our pilots also engaged the enemy over London, and a third in the vicinity of the capital at 11,000 ft. All our machines returned safely.

"Full reports of casualties and damage in London have not yet been received. Bombs were also dropped in various places in Kent and Essex."

"December 19th, 12.45 p.m.

"Latest police reports state that 10 persons were killed and 70 injured in London in last night's air raid. Outside London only five persons were injured. Several fires occurred, but the material damage is not serious. No damage was caused to naval or military establishments."

### German Version.

"Berlin, December 19th.

"Our airmen effectively attacked with bombs London, Ramsgate, and Margate."





# The British Air Service

"PER ARDUA AD ASTRA"



UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

Admiralty, December 17th.

**Probationary Flight Officer (Temporary).**—H. Saunders, entered as Prob. Observer Officer (temp.), with original seniority of Oct. 7th.

The following have been entered as Prob. Flight Officers (temp.):—J. E. Gow, G. F. Fountain, C. C. Fisher, G. Dutton, F. J. C. Bush, R. S. C. A. Didwell, and R. H. Barker.

The following have been entered as Prob. Flight Officers (temp.) and all appointed to "President II" for R.N.A.S.—W. R. Reid, H. A. Lye, D. MacDougall, H. J. McLeod, and A. H. Hull.

A. G. Buckingham granted temp. commission as Lieut. (R.N.V.R.), seniority Dec. 9th.

Admiralty, December 18th.

The following Prob. Flight Officers have been promoted to rank of Flt. Sub-Lieut., with original seniority:—J. N. Rutter, A. W. Slater, D. V. Carnegie, C. T. Dodd, A. Woods, F. G. H. Hooper, A. D. Reid, A. R. Kelly, G. Dymore-Brown, E. G. Jones, L. Jolly, C. G. Duckworth, J. W. Thompson, and M. F. Oakley.

**Sub-Lieutenant, R.N.V.R. (Temporary).**—J. M. Weishman, entered as Prob. Flight Officer (temp.), seniority Dec. 2nd.

**Signaller (R.N.V.R.).**—I. D. Stewart, entered as Prob. Observer Officer (temp.), seniority Dec. 29th.

**3rd Writer.**—F. Hopwood, entered as Prob. Observer Officer (temp.), seniority, Dec. 11th.

G. S. Hall and F. E. Jackson, both granted temp. commissions as Lieut. (R.N.V.R.), seniority respectively Dec. 14th and 17th.

Temp. commissions as Sub-Lieut. (R.N.V.R.) have been granted to H. W. Taylor and R. Hopkin, seniority respectively Dec. 5th and 10th.

Admiralty, December 19th.

The following Prob. Flight Officers (temp.) have been promoted to rank of Flt. Sub-Lieut. (Temp.), with original seniority:—W. A. Ashley, W. S. B. Freer, W. A. Yeulett, M. A. Taylerson, E. V. Bell, C. E. Horrex, G. R. Nodwell, J. R. F. Randell, G. E. Taylor, K. H. G. Tilley, H. Sutherland, L. P. Coombes, A. S. Graves, A. H. C. Randall, F. Kemp, A. L. Jones, A. P. Stock, H. M. O'Loughlin, P. A. Marriott, H. A. Patey, M. H. Bailey, H. S. Eaton, G. R. Ashton, J. H. Curtis, A. J. O. Farina, E. P. O. Haughton, J. W. G. Price, L. M. Hilton, E. G. Rice, G. B. Gates, L. Latham, J. C. G. Macdonald, J. H. Caudell, R. E. Wallis, G. R. J. Parkinson, L. C. Bower, D. C. S. Bland, D. M. Allen, C. E. Wodehouse, L. B. Ransford, E. H. Wells, S. J. Chamberlain, R. I. Kirkland, R. E. Burr, F. C. Sherwood, P. Smallwood, and C. L. Fraser.

**Probationary Flight Officers (Temporary).**—D. E. Spalton and A. Boyd, entered as Prob. Observer Officers (temp.), seniority Oct. 7th.

The following have been entered as Prob. Flight Officers (temp.):—G. E. Sands, W. C. Wildley, W. G. Wheatland, P. R. Clare, W. H. R. Lukey, C. R. Moore, E. B. Marquick, R. H. Rose, K. Stuart-Smith, M. Whitehead, C. H. Coggins, R. Henderson, K. G. Brabner, and F. N. P. Ritchie.

Mr. A. G. V. Reeves entered as Prob. Observer Officer (temp.), seniority Dec. 29th.

Temp. commissions (R.N.V.R.) have been granted to the following:—Lieut. T. le gee Pynches. Sub-Lieuts.—W. T. Kanaar, E. H. Watson, L. D. Stuart, and F. Begley.

## Royal Flying Corps (Military Wing).

London Gazette Supplement, December 17th.

The following temp. appointments are made at the War Office:—**Staff Lieutenant.**—2nd Lieut. (Hon. Capt.) A. V. Hambro, (T.F.), Res., from an Equipment Officer, 2nd Cl., R.F.C.; Dec. 1st.

The following appointments are made:—

**Wing Commanders.**—From Sqdn. Comdrs., and to be Temp. Lieut.-Cols. whilst so employed:—Capt. (Temp. Major) F. H. Jenkins, M.C., S.R.; Sept. 15th. Major L. Jenkins, M.C., R.G.A. (T.F.); Nov. 22nd. Major J. R. C. Heathcote, Cam'n. Highrs.; Nov. 26th.

**Flight Commanders.**—From Flying Officers, and to be Temp. Capts. whilst so employed:—Temp. Lieut. R. L. Stevenson, Gen. List; Temp. 2nd Lieut. (Temp. Lieut.) F. J. Woollard, Gen. List; Dec. 4th.

**Flying Officers.**—2nd Lieut. H. E. Hastie, High. L.I., S.R., and to be sec'd.; Sept. 14th. Temp. 2nd Lieut. D. P. Cameron, Gen. List; Sept. 20th. Lieut. A. P. Maclean, R. Scots (T.F.), and to be sec'd.; Oct. 26th. 2nd Lieut. A. L. Seddon, Lond. R. (T.F.), and to be sec'd.; Oct. 5th. Temp. 2nd Lieut. R. V. Nalder, Gen. List, from a Flying Officer (Ob.); Oct. 14th, seniority Oct. 3rd, 1916. 2nd Lieut. J. R. Foster, Yeo. (T.F.), and to be sec'd.; Oct. 19th. 2nd Lieut. C. D. Bremmer, Yeo. (T.F.), and to be sec'd.; Oct. 25th. Temp. 2nd Lieut. C. Evans, Gen. List; Nov. 18th. Capt. M. L. Doyle, Canadian Exped. Force; Nov. 27th. 2nd Lieut. J. A. Percy, Yeo. (T.F.), and to be sec'd.; Nov. 28th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. T. K. Shipwright; June 4th. L. W. Flynn, V. Voss; Oct. 16th. D. G. Scott; Nov. 3rd. J. R. Fullerton, A. E. Bingham, A. Crozier, W. Hewby, J. Craig; Nov. 26th. F. J. L. Bishop, C. B. Turner; Nov. 29th.

**Equipment Officers, 1st Class.**—Capt. L. S. B. Hull, R.W. Surr. R. (T.F.), from 2nd Cl.; Oct. 22nd. From 2nd Cl., and to be Temp. Capts. whilst so employed:—Lieut. L. H. B. Cosway, S.R.; 2nd Lieuts. (Temp. Lieuts.), S.R.:—T. G. MacKenzie, A. C. Smith, R. Donald, J. D. Campion; Dec. 1st. Temp. 2nd Lieut. (Temp. Lieut.) J. P. Angell, Gen. List. 2nd Cl.—From 3rd Cl., and to be Temp. Lieuts. whilst so employed:—Temp. 2nd Lieut. S. Crowther, Gen. List; Nov. 3rd. Temp. 2nd Lieut. H. Howard, Gen. List; Nov. 10th. Temp. Lieut. G. Osmand, Gen. List, from a Flying Officer; Nov. 20th. Temp. Lieut. C. W. Jamieson, Gen. List, from 3rd Cl.; Nov. 21st. 2nd Lieut. A. R. Jones, S.R., from a Flying Officer; Nov. 23rd. Temp. 2nd Lieut. C. J. Strother, Gen. List, from 3rd Cl.; Dec. 10th. 3rd Cl.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. H. Turner, R. B. Winyard; Oct. 20th. F. V. Harrap, F. M. Roberts; Nov. 12th. G. J. Finley; Nov. 16th. G. Bowden, H. Dixon, W. J. Hollis, F. T. Holmes, J. H. Lytle, F. V. Ruston, W. E. Langton, J. H. M. Stevenson; Nov. 21st. R. D. Owen, B. Finnigan, N. D. Bryce; Nov. 24th. O. Charlton, E. W. S. Jacobi; Nov. 28th.

Schools of Military Aeronautics.

**Assistant Instructors (graded as Equipment Officers, 2nd Class).**—Temp. 2nd Lieut. P. C. Hollingsworth, M.C., Gen. List, a Flying Officer (Ob.), and to be Temp. Lieut. whilst so employed; Aug. 29th. Appointment of Lieut. A. Hollingsworth, Canadian Local Forces, notified in Gazette of Nov. 27th, is cancelled.

Schools of Instruction—Wireless School.

**Commandant (graded as a Depot Commander).**—Capt. (Temp. Major) J. B. Bowen, Yeo. (T.F.), from a Comdt. (graded as a Park Comdr.), School of Wireless Operators, and to be Temp. Lieut.-Col. whilst so employed; Oct. 12th.

Balloon Schools of Instruction.

**Commandant (graded as a Squadron Commander).**—Lieut. (Temp. Capt.) G. S. Sansom, M.C., S.R., a Balloon Co. Comdr. (graded as a Flight Comdr.), and to be Temp. Major whilst so employed, vice Temp. Major A. H. Parker, M.C., Gen. List; Nov. 24th.

School of Inspection.

**Commandant (graded as a Park Commander).**—2nd Lieut. (Temp. Capt.) C. H. Stevens, S.R., an Equipment Officer, 1st Cl., and to be Temp. Major whilst so employed; Nov. 21st.

School of Technical Training.

**Chief Instructor (Technical Section, graded as a Park Commander).**—Lieut. (Temp. Major) V. W. Eyre, S.R., from a Special Appointment (graded as a Park Comdr.), and to retain his temp. rank whilst so employed; Nov. 21st.

**General List.**—Temp. 2nd Lieut. E. P. Crossen to be Temp. Lieut.; Nov. 27th. Temp. 2nd Lieut. J. Cann-Lippincott resigns his commission; Dec. 18th.

**Supplementary to Regular Corps.**—Lieut. F. H. C. O'Beirne resigns his commission on account of physical unsuitability as a Pilot or Observer; Dec. 18th.

London Gazette Supplement, December 18th.

The following temp. appointments are made at the War Office:—**Staff Lieutenants.**—2nd Lieut. T. D. Bucknill, R.F.C., S.R., from an Equipment Officer, 3rd Cl.; Sept. 28th.

**General List.**—A. R. M. Carse, late Australian Imperial Force, to be Temp. 2nd Lieut.; Dec. 11th.

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**Staff Officer, 2nd Class (graded for pay as a Brigadier-Major).**—The appointment of Lieut. (Temp. Capt.) C. E. Wardle, R.F.C., S.R., is post-dated to Nov. 1st.

The following appointments are made:—

**Wing Commander.**—Capt. (Temp. Major) A. Shekleton, R. Muns. Fus., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Nov. 21st.

**Squadron Commanders.**—Capt. (Temp. Lieut.-Col.) C. F. Lee, Yeo. (T.F.), a Staff Offr., 1st Cl. (graded as an A.A.G.), and to retain his temp. rank (but without pay or allowances of that rank) whilst specially employed; Nov. 17th. Lieut. (Temp. Capt.) F. W. Stent, S.R., from a Flight Comdr., and to be Temp. Major whilst so employed; Nov. 21st.

**Flight Commanders.**—From Flying Officers:—Lieut. E. Y. Hughes, R.F.A. (T.F.), and to be Temp. Capt. whilst so employed; Nov. 40th. Capt. B. U. S. Cripps, M.C., Welsh R.; and to be Temp. Capts. whilst so employed:—Lieut. R. Hilton, M.C., R.A.; Temp. 2nd Lieut. (Temp. Lieut.) G. F. W. Zimmer, Gen. List; Lieut. F. J. Watts, Essex R. (T.F.); 2nd Lieut. H. L. Tracy, S.R.; Dec. 2nd. 2nd Lieut. S. J. Schooley, S.R.; Dec. 3rd.

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.), Gen. List and to be confirmed in their rank:—A. F. Lingard, L. C. Galloway; Nov. 22nd. R. Watson, E. W. Barry, R. E. Robb; Nov. 23rd. L. Gowsell, M. G. S. Burger; Nov. 28th.

**Balloon Wing Commander.**—Capt. (Temp. Major) F. M. Roxby, N. Staff. R., S.R., from a Balloon Co. Comdr. (graded as a Sqdn. Comdr.) and to be Temp. Lieut.-Col. whilst so employed; Nov. 1st.

**Adjutant.**—The appointment of 2nd Lieut. (Temp. Capt.) J. T. Pym, E. Surr. R., S.R., notified in Gazette of Sept. 24th, is antedated to July 30th.

**Special Appointments (graded as Equipment Officers, 1st Class).**—From graded as Equipment Officers, 2nd Cl.; Oct. 15th:—Temp. Capt. G. A. Scott, Essex R.; and to be Temp. Capts. while so employed:—2nd Lieut. (Temp. Lieut.) A. G. Saxty, Som. L.I. (T.F.); 2nd Lieut. (Temp. Lieut.) C. D. Kershaw, W. Rid. R., S.R.

**Equipment Officers, 2nd Class.**—From 3rd Cl. (Dec. 1st):—Lieut. C. Cadman, Yeo. (T.F.); and to be Temp. Lieuts while so employed:—2nd Lieut. H. H. Greig, Res. of Off.; 2nd Lieut. F. E. Hobley, S.R.; 2nd Lieut. H. G. Welsford, S.R.; 2nd Lieut. T. Moor, S.R.; 2nd Lieut. A. H. Prior, S.R.; Temp. 2nd Lieut. T. J. Owen, Gen. List; Temp. 2nd Lieut. L. D. Brown, Gen. List; Temp. 2nd Lieut. S. Williamson, Gen. List.

**3rd Class.**—2nd Lieut. A. E. Barbe, High. L.I. (T.F.), and to be sec'd.; July 1st. 2nd Lieut. J. H. Falconer, A. Cyclist Corps (T.F.), and to be sec'd.; Nov. 27th. 2nd Lieut. J. C. Lathan, Linc. R. (T.F.); Nov. 29th. 2nd Lieut. L. S. Smith, N. Staffs. R., S.R.; Nov. 30th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. Hawkins; July 1st. J. M. Moore, T. Harris, H. C. King; Oct. 12th. F. M. Burr, I. Bawden, J. K. Bell, A. R. Morrison, J. E. Tyrrell, W. F. Bate, L. M. Britten, C. L. G. Colebrook, J. R. Coulthard, P. L. Hill, O. N. H. Watson, D. F. Winch; Nov. 21st.

Schools of Instruction. Armament School.

**Commandant (graded as a Wing Commander).**—Capt. (Temp. Lieut.-Col.) A. C. H. MacLean, R. Scots, from Comdt., Central Flying School, and to be Temp. Col. while so employed; Nov. 21st.

**Assistant Commandant (graded as a Depot Commander).**—Capt. (Temp. Major) A. C. Bishop, Yeo. (T.F.), from a Comdt. (graded as a Park Comdr.), and to be Temp. Lieut.-Col. while so employed; Nov. 21st.

**Chief Instructor in Gunnery (graded as a Park Commander).**—Lieut. (Temp. Capt.) E. E. Smith, E. Yorks. R., from an Instructor in Gunnery (graded as an Equipment Officer, 1st Cl.), and to be Temp. Major while so employed; Nov. 21st.

**Camp Commandant (graded as a Park Commander).**—Capt. T. B. Hornblower, R. Suss. R. (T.F.), from an Adj., and to be Temp. Major while so employed; Nov. 21st.

**General List.**—To be Temp. 2nd Lieuts. (on prob.):—J. C. Wood; Sept. 22nd. J. H. Smith; Oct. 13th. C. Le R. Treleven; Oct. 27th. Flight-Sgt. W. Higson, from R.F.C.; Nov. 26th. Cdt. J. E. Brance, from R.F.C.; Nov. 28th. J. P. Young; Nov. 29th. \* T. Rivers-Fry, C. J. Aust. F. C. E. Burton; Dec. 3rd.

**Brigade Major.**—Lieut. (Temp. Capt.) W. L. Birch, W. York. R. (T.F.), from a Staff Officer, 3rd Cl. (graded as Staff Capt.), and to retain his temp. rank while so employed; Sept. 15th.

**Memorandum.**—Mr. Sgt. W. C. Ibbott from R.F.C. to be 2nd Lieut. or duty with R.F.C.; Nov. 23rd.

Aeronautical Inspection Department.

London Gazette Supplement, December 19th.

Temp. Hon. Lieut. A. N. Barnett to be Temp. Hon. Capt. whilst employed as Inspector A.I.D. June 1st.



airmen will play a preponderating part, or else, instead of flying corps against flying corps, there will be attacks on towns, stations, factories, and depôts behind the lines. Sacrifices, he contends, we must make, for the vital need of air supremacy cannot be too strongly urged. We are now passing through the last moments in which our efforts can influence the decisive hours of the first five days.

OVER £10 in farthings has been collected amongst the poor at Limehouse to go towards the provision of a motor-ambulance for air-raid work. Thus is the fame of the Kaiser spread amongst the lowliest of London's inhabitants.

WITH their usual ingenuity, the R.F.C. this week, when the frost came, quickly evolved a sledge out of old aeroplane runners and displayed their prowess at tobogganing on the hill slopes at Orpington and Biggin Hill, a number of convalescent soldiers being amongst those who enjoyed the sport.

IN the very remarkable series of clauses embodied in the terms of the Russian-German armistice published last week, provision is made for controlling aerial enterprise. Article VI says that in order to avoid unrest and incidents at the front no operations may be undertaken for 10 miles behind the fronts. A 6-mile zone behind each side's own demarcation lines applies for the aerial forces.

SERIOUS precautions against expected attacks by great British and American air squadrons, says the Dutch newspaper *Tyd*, are being taken by Cologne, and other Rhenish and Westphalian towns. New anti-aircraft guns have been installed and bomb-proof shelters built. The population has also received new instructions for safety.

IN this connection the following regulations, which have evidence in them of the taking advantage of wisdom begotten of experience, as a result of the Hun air-pirates' attack upon British cities, are the latest issued by the German authorities:—

"THE military authorities again draw attention to the fact that the darkening of windows, &c., is not yet carried out in a satisfactory manner.

"The object of shading all sources of light is to make it impossible for enemy aircraft to take their bearings during their flight, and to make it more difficult for them to drop bombs on localities where they could do damage.

"As a matter of fact the complete darkening of towns near the Western front, which has been carried out in accordance with the regulations, has been so successful that many flyers have so completely lost their bearings as to land within our lines, while on the other hand bombs have been dropped repeatedly on localities of no military or commercial value whatever, simply because they were brilliantly illuminated.

"The lighting regulations are therefore a protection to the individual as well as to the masses.

"Particularly reprehensible is the habit of turning on lights during an air attack, without first properly shading the source of light.

"The police now have instructions to see that the regulations are carried out to the letter, and those offending will be dealt with with the utmost rigour of the law.

"The following are considered to be efficient means of darkening for private houses and business premises:—

"Closing up windows, doors, &c. by means of fixed or roll

## "X" AIRCRAFT RAIDS.

### "X 85" Raid (December 18th).

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief, Home Forces:—

"December 18th, 9.48 p.m.

"Hostile aeroplanes crossed the Kent and Essex coast about 6.15 p.m. and proceeded towards London. Some of the raiders reached the London district and dropped bombs. Bombs were also dropped in Kent and Essex. Reports of casualties and damage have not yet been received. Our guns and aeroplanes were both in action."

"December 19th, 11 a.m.

"Latest reports indicate that from 16 to 20 enemy aeroplanes took part in last night's air raid. Three groups of raiders crossed the Kent Coast between 6.15 and 6.25 p.m., and three other groups crossed the Essex Coast between 6.10 and 6.45 p.m. All six groups made towards London. Most of the raiders were turned back by gun-fire at various places, only about five machines actually reaching and bombing the capital between 7 and 8 p.m. After the main attack on London had terminated a single aeroplane made its way over the capital about 9 p.m.

"One raider was hit by gunfire and finally came down in the sea off the Kentish Coast, two of its crew of three men

shutters; covering windows, &c., with a coat of paint or by hanging blinds, curtains, &c., made of material or paper in such a manner that the number of lights is not discernible from outside; shading the source of light itself by means of cardboard shades, thick paper, &c., in such a manner that the direct rays of light do not fall upon the windows or doors.

"It is to be hoped that the patriotism of our fellow-citizens will induce them to put up with the inconvenience of shading their lights in the manners indicated without murmur, and thus avoid the necessity of police action being taken against offenders.

"In conclusion, it is again urgently requested that private individuals should refrain from using the telephone during or immediately after an air raid, more especially in respect to making inquiries from the post office or other public buildings regarding the progress of the raid.

"Officials have instructions not to answer such inquiries, as they only endanger the necessary official telephoning.

"In response to an urgent demand on the part of the public, it has been decided to notify the all-clear after a raid by blasts on a siren. As soon as the necessary arrangements in this direction have been made the details will be published.

"F. H."

### TEN YEARS AGO.

Excerpts from the "Auto," ("FLIGHT's" precursor and sister Journal of December 14th, 1907. "FLIGHT" was founded in 1908.

#### THE BLÉRIOT AEROPLANE.

The fates are apparently now kinder to M. Blériot, and he, on December 7th was successful in making two or three very good flights, the first of which was a semi-circular course of about 160 yards, the second a straight flight of about 600 yards, and the third another straight flight of about 500 yards.

#### THE FARMAN AEROPLANE.

On Friday of last week Mr. Farman's aeroplane met with a mishap, which occurred, however, while it was being taken out for trial, and not during the course of an actual flight. The machine toppled over, apparently as the result of recent alterations resulting in the lightening of the tail, and the damage caused to the framework was somewhat considerable.

#### DE MARCAY AIRSHIP.

An airship designed on most original lines has been constructed by the Baron de Marçay in conjunction with M. Kluytmann, who is acting as engineer. Its peculiarity consists in dividing the gas vessel, which is very long, into two entirely distinct sections at the middle, and in mounting the propeller, which is of enormous diameter, in the gap thus provided.

#### THE GASTAMBIDE-MENGIN AEROPLANE.

Two other well-known automobilists in France have now come to the fore in the aeronautical world. Messrs. Gastambide and Mengin having combined forces with a view to experimenting with a heavier-than-air machine. It will be equipped with an 8-cylinder 50 h.p. Antoinette engine, which will drive a tractor screw of 2 metres in diameter, and 1.3 metres pitch. The total surface available will be 24 sq. metres, and the weight 350 kilogs. It is anticipated that it should rise at a speed of from 55 to 60 kilos. per hour.

being captured alive by an armed trawler. There is reason to suppose that another enemy aeroplane came down in the Channel, but this is unconfirmed at present.

"One of our pilots attacked and fired two drums of ammunition into a raider as the latter was in the act of dropping bombs on London from a height of 13,000 ft. Another of our pilots also engaged the enemy over London, and a third in the vicinity of the capital at 11,000 ft. All our machines returned safely.

"Full reports of casualties and damage in London have not yet been received. Bombs were also dropped in various places in Kent and Essex."

"December 19th, 12.45 p.m.

"Latest police reports state that 10 persons were killed and 70 injured in London in last night's air raid. Outside London only five persons were injured. Several fires occurred, but the material damage is not serious. No damage was caused to naval or military establishments."

#### German Version.

"Berlin, December 19th.

"Our airmen effectively attacked with bombs London, Ramsgate, and Margate."





# The British Air Services

"PER ARDUA AD ASTRA"



UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

Admiralty, December 17th.

**Probationary Flight Officer (Temporary).**—H. Saunders, entered as Prob. Observer Officer (temp.), with original seniority of Oct. 7th.

The following have been entered as Prob. Flight Officers (temp.):—J. E. Gow, G. F. Fountain, C. C. Fisher, G. Dutton, F. J. C. Bush, R. S. C. A. Didwell, and R. H. Barker.

The following have been entered as Prob. Flight Officers (temp.) and all appointed to "President II" for R.N.A.S.—W. R. Reid, H. A. Lye, D. MacDougall, H. J. McLeod, and A. H. Hull.

A. G. Buckham granted temp. commission as Lieut. (R.N.V.R.), seniority Dec. 9th.

Admiralty, December 18th.

The following Prob. Flight Officers have been promoted to rank of Flt. Sub-Lieut., with original seniority:—J. N. Rutter, A. W. Slater, D. V. Carnegie, C. T. Dodd, A. Woods, F. G. H. Hooper, A. D. Reid, A. R. Kelly, G. Dymore-Brown, E. G. Jones, L. Jolly, C. G. Duckworth, J. W. Thompson, and M. F. Oakley.

**Sub-Lieutenant, R.N.V.R. (Temporary).**—J. M. Weishman, entered as Prob. Flight Officer (temp.), seniority Dec. 2nd.

**Signaller (R.N.V.R.).**—I. D. Stewart, entered as Prob. Observer Officer (temp.), seniority Dec. 29th.

**3rd Writer.**—F. Hopwood, entered as Prob. Observer Officer (temp.), seniority, Dec. 11th.

G. S. Hall and F. E. Jackson, both granted temp. commissions as Lieut. (R.N.V.R.), seniority respectively Dec. 14th and 17th.

Temp. commissions as Sub-Lieut. (R.N.V.R.) have been granted to H. W. Taylor and R. Hopkin, seniority respectively Dec. 5th and 10th.

Admiralty, December 19th.

The following Prob. Flight Officers (temp.) have been promoted to rank of Flt. Sub-Lieut. (Temp.), with original seniority:—W. A. Ashley, W. S. B. Freer, W. A. Yeulett, M. A. Taylerson, E. V. Bell, C. E. Horrex, G. R. Nodwell, J. R. F. Randell, G. E. Taylor, K. H. G. Tilley, H. Sutherland, L. P. Coombes, A. S. Graves, A. H. C. Randall, F. Kemp, A. L. Jones, A. P. Stock, H. M. O'Loughlin, P. A. Marriott, H. A. Patey, M. H. Bailey, H. S. Eaton, G. R. Ashton, J. H. Curtis, A. J. O. Farina, E. P. O. Houghton, J. W. G. Price, L. M. Hilton, E. G. Rice, G. B. Gates, L. Latham, J. C. G. Macdonald, J. H. Caudell, R. E. Wallis, G. R. J. Parkinson, L. C. Bower, D. C. S. Bland, D. M. Allen, C. E. Wodehouse, L. B. Ranford, E. H. Wells, S. J. Chamberlain, R. I. Kirkland, R. E. Burr, F. C. Sherwood, P. Smallwood, and C. L. Fraser.

**Probationary Flight Officers (Temporary).**—D. E. Spalton and A. Boyd, entered as Prob. Observer Officers (temp.), seniority Oct. 7th.

The following have been entered as Prob. Flight Officers (temp.):—G. E. Sands, W. C. Willdey, W. G. Wheatland, P. R. Clare, W. H. R. Lukey, C. R. Moore, E. B. Marquick, R. H. Rose, K. Stuart-Smith, M. Whitehead, C. H. Coggins, R. Henderson, K. G. Brabner, and F. N. P. Ritchie.

Mr. A. G. V. Reeves entered as Prob. Observer Officer (temp.), seniority Dec. 29th.

Temp. commissions (R.N.V.R.) have been granted to the following:—Lieut. —T. Legee Pynches. Sub-Lieuts.—W. T. Kanaar, E. H. Watson, L. D. Stuart, and F. Begley.

## Royal Flying Corps (Military Wing).

London Gazette Supplement, December 17th.

The following temp. appointments are made at the War Office:—**Staff Lieutenant.**—2nd Lieut. (Hon. Capt.) A. V. Hambro, (T.F.), Res., from an Equipment Officer, 2nd Cl., R.F.C.; Dec. 1st.

The following appointments are made:—**Wing Commanders.**—From Sqdn. Comdrs., and to be Temp. Lieut.-Cols. whilst so employed:—Capt. (Temp. Major) F. H. Jenkins, M.C., S.R.; Sept. 15th. Major L. Jenkins, M.C., R.G.A. (T.F.); Nov. 22nd. Major J. R. C. Heathcote, Cam'n. Highrs.; Nov. 26th.

**Flight Commanders.**—From Flying Officers, and to be Temp. Capts. whilst so employed:—Temp. Lieut. R. L. Stevenson, Gen. List; Temp. 2nd Lieut. (Temp. Lieut.) F. J. Woodard, Gen. List; Dec. 4th.

**Flying Officers.**—2nd Lieut. H. E. Hastie, High. L.I., S.R., and to be sec'd.; Sept. 14th. Temp. 2nd Lieut. D. P. Cameron, Gen. List; Sept. 20th. Lieut. A. P. Maclean, R. Scots (T.F.), and to be sec'd.; Oct. 26th. 2nd Lieut. A. L. Seddon, Lond. R. (T.F.), and to be sec'd.; Oct. 5th. Temp. 2nd Lieut. R. V. Nalder, Gen. List, from a Flying Officer (Ob.); Oct. 14th, seniority Oct. 3rd, 1916. 2nd Lieut. J. R. Foster, Yeo. (T.F.), and to be sec'd.; Oct. 19th. 2nd Lieut. C. D. Bremmer, Yeo. (T.F.), and to be sec'd.; Oct. 25th. Temp. 2nd Lieut. C. Evans, Gen. List; Nov. 18th. Capt. M. L. Doyle, Canadian Exped. Force; Nov. 27th. 2nd Lieut. J. A. Percy, Yeo. (T.F.), and to be sec'd.; Nov. 28th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. T. K. Shipwright; June 4th. L. W. Flynn, V. Voss; Oct. 16th. D. G. Scott; Nov. 3rd. J. R. Fullarton, A. E. Bingham, A. Crozier, W. Hewby, F. Craig; Nov. 26th. F. J. L. Bishop, C. B. Turner; Nov. 29th.

**Equipment Officers, 1st Class.**—Capt. L. S. B. Hull, R.W. Surr, R. (T.F.), from 2nd Cl.; Oct. 22nd. From 2nd Cl., and to be Temp. Capts. whilst so employed:—Lieut. L. H. B. Cosway, S.R.; 2nd Lieuts. (Temp. Lieuts.), S.R.:—T. G. MacKenzie, A. C. Smith, R. Donald, J. D. Campion; Dec. 1st. Temp. 2nd Lieut. (Temp. Lieut.) J. P. Angell, Gen. List. 2nd Cl.—From 3rd Cl., and to be Temp. Lieuts. whilst so employed:—Temp. 2nd Lieut. S. Crowther, Gen. List; Nov. 3rd. Temp. 2nd Lieut. H. Howard, Gen. List; Nov. 10th. Temp. Lieut. G. Osmand, Gen. List, from a Flying Officer; Nov. 20th. Temp. Lieut. C. W. Jamieson, Gen. List, from 3rd Cl.; Nov. 21st. 2nd Lieut. A. R. Jones, S.R., from a Flying Officer; Nov. 23rd. Temp. 2nd Lieut. C. J. Strother, Gen. List, from 3rd Cl.; Dec. 10th. 3rd Cl.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A. H. Turner, R. B. Winyard; Oct. 20th. F. V. Harrap, F. M. Roberts; Nov. 12th. G. J. Finley; Nov. 16th. G. Bowden, H. Dixon, W. J. Hollis, F. T. Holmes, J. H. Lytle, F. V. Ruston, W. E. Langton, J. H. M. Stevenson; Nov. 21st. R. D. Owen, B. Finnigan, N. D. Bryce; Nov. 24th. O. Charlton, E. W. S. Jacobi; Nov. 28th.

Schools of Military Aeronautics.

**Assistant Instructors (graded as Equipment Officers, 2nd Class).**—Temp. 2nd Lieut. P. C. Hollingsworth, M.C., Gen. List, a Flying Officer (Ob.), and to be Temp. Lieut. whilst so employed; Aug. 29th. Appointment of Lieut. A. Hollingsworth, Canadian Local Forces, notified in Gazette of Nov. 27th, is cancelled.

Schools of Instruction—Wireless School.

**Commandant (graded as a Depot Commander).**—Capt. (Temp. Major) J. B. Bowen, Yeo. (T.F.), from a Comdt. (graded as a Park Comdr.), School of Wireless Operators, and to be Temp. Lieut.-Col. whilst so employed; Oct. 12th.

Balloon Schools of Instruction.

**Commandant (graded as a Squadron Commander).**—Lieut. (Temp. Capt.) G. S. Sansom, M.C., S.R., a Balloon Co. Comdr. (graded as a Flight Comdr.), and to be Temp. Major whilst so employed, vice Temp. Major A. H. Parker, M.C., Gen. List; Nov. 24th.

School of Inspection.

**Commandant (graded as a Park Commander).**—2nd Lieut. (Temp. Capt.) C. H. Stevens, S.R., an Equipment Officer, 1st Cl., and to be Temp. Major whilst so employed; Nov. 21st.

School of Technical Training.

**Chief Instructor (Technical Section, graded as a Park Commander).**—Lieut. (Temp. Major) V. W. Eyre, S.R., from a Special Appointment (graded as a Park Comdr.) and to retain his temp. rank whilst so employed; Nov. 21st.

**General List.**—Temp. 2nd Lieut. E. P. Crossen to be Temp. Lieut.; Nov. 27th. Temp. 2nd Lieut. J. Cann-Lippincott resigns his commission; Dec. 18th.

**Supplementary to Regular Corps.**—Lieut. F. H. C. O'Beirne resigns his commission on account of physical unsuitability as a Pilot or Observer; Dec. 18th.

London Gazette Supplement, December 18th.

The following temp. appointments are made at the War Office:—

**Staff Lieutenants.**—2nd Lieut. T. D. Bucknill, R.F.C., S.R., from an Equipment Officer, 3rd Cl.; Sept. 28th.

**General List.**—A. R. M. Carse, late Australian Imperial Force, to be Temp. 2nd Lieut.; Dec. 11th.

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**Staff Officer, 2nd Class (graded for pay as a Brigadier-Major).**—The appointment of Lieut. (Temp. Capt.) C. E. Wardle, R.F.C., S.R., is post-dated to Nov. 1st.

The following appointments are made:—

**Wing Commander.**—Capt. (Temp. Major) A. Shekleton, R. Muns. Fus., from a Sqdn. Comdr., and to be Temp. Lieut.-Col. whilst so employed; Nov. 21st.

**Squadron Commanders.**—Capt. (Temp. Lieut.-Col.) C. F. Lee, Yeo. (T.F.), a Staff Officer, 1st Cl. (graded as an A.A.G.), and to retain his temp. rank (but without pay or allowances of that rank) whilst specially employed; Nov. 17th. Lieut. (Temp. Capt.) F. W. Stent, S.R., from a Flight Comdr., and to be Temp. Major whilst so employed; Nov. 21st.

**Flight Commanders.**—From Flying Officers:—Lieut. E. Y. Hughes, R.F.A. (T.F.), and to be Temp. Capt. whilst so employed; Nov. 40th. Capt. B. U. S. Cripps, M.C., Welsh R.; and to be Temp. Capts. whilst so employed:—Lieut. R. Hilton, M.C., R.A.; Temp. 2nd Lieut. (Temp. Lieut.) G. F. W. Zimmer, Gen. List; Lieut. F. J. Watts, Essex R. (T.F.); 2nd Lieut. H. L. Tracy, S.R.; Dec. 2nd. 2nd Lieut. S. J. Schooley, S.R.; Dec. 3rd.

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.), Gen. List and to be confirmed in their rank:—A. F. Lingard, L. C. Galloway; Nov. 22nd. R. Watson, E. W. Barry, R. E. Robb; Nov. 23rd. L. Gowsell, M. G. S. Burger; Nov. 28th.

**Balloon Wing Commander.**—Capt. (Temp. Major) F. M. Roxby, N. Staff. R., S.R., from a Balloon Co. Comdr. (graded as a Sqdn. Comdr.) and to be Temp. Lieut.-Col. whilst so employed; Nov. 1st.

**Adjutant.**—The appointment of 2nd Lieut. (Temp. Capt.) J. T. Pym, E. Surr. R., S.R., notified in Gazette of Sept. 24th, is antedated to July 30th.

**Special Appointments (graded as Equipment Officers, 1st Class).**—From graded as Equipment Officers, 2nd Cl.; Oct. 15th:—Temp. Capt. G. A. Scott, Essex R.; and to be Temp. Capts. while so employed:—2nd Lieut. (Temp. Lieut.) A. G. Saxty, Som. L.I. (T.F.); 2nd Lieut. (Temp. Lieut.) C. D. Kershaw, W. Rid. R., S.R.

**Equipment Officers, 2nd Class.**—From 3rd Cl. (Dec. 1st):—Lieut. C. Cadman, Yeo. (T.F.); and to be Temp. Lieuts while so employed:—2nd Lieut. H. H. Greig, Res. of Off.; 2nd Lieut. F. E. Hobley, S.R.; 2nd Lieut. H. G. Weisford, S.R.; 2nd Lieut. T. Moor, S.R.; 2nd Lieut. A. H. Prior, S.R.; Temp. 2nd Lieut. T. J. Owen, Gen. List; Temp. 2nd Lieut. L. D. Brown, Gen. List; Temp. 2nd Lieut. S. Williamson, Gen. List.

**3rd Class.**—2nd Lieut. A. E. Barbe, High. L.I. (T.F.), and to be sec'd.; July 1st. 2nd Lieut. J. H. Falconer, A. Cyclist Corps (T.F.), and to be sec'd.; July 27th. 2nd Lieut. J. C. Lathan, Linc. R. (T.F.); Nov. 29th. 2nd Lieut. L. S. Smith, N. Staffs. R., S.R.; Nov. 30th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. Hawkins; July 1st. J. M. Moore, T. Harris, H. C. King; Oct. 12th. F. M. Burr, I. Bawden, J. K. Bell, A. R. Morrison, J. E. Tyrrell, W. F. Bate, L. M. Britten, C. L. G. Colebrook, J. R. Coulthard, P. L. Hill, O. N. H. Watson, D. F. Winch; Nov. 21st.

Schools of Instruction. Armament School.

**Commandant (graded as a Wing Commander).**—Capt. (Temp. Lieut.-Col.) A. C. H. MacLean, R. Scots, from Comdt., Central Flying School, and to be Temp. Col. while so employed; Nov. 21st.

**Assistant Commandant (graded as a Depot Commander).**—Capt. (Temp. Major) A. C. Bishop, Yeo. (T.F.), from a Comdt. graded as a Park Comdr., and to be Temp. Lieut.-Col. while so employed; Nov. 21st.

**Chief Instructor in Gunnery (graded as a Park Commander).**—Lieut. (Temp. Capt.) E. E. Smith, E. Yorks. R., from an Instructor in Gunnery (graded as an Equipment Officer, 1st Cl.), and to be Temp. Major while so employed; Nov. 21st.

**Camp Commandant (graded as a Park Commander).**—Capt. T. B. Hornblower, R. Suss. R. (T.F.), from an Adjnt., and to be Temp. Major while so employed; Nov. 21st.

**General List.**—To be Temp. 2nd Lieuts. (on prob.):—J. C. Wood; Sept. 22nd. J. H. Smith; Oct. 13th. C. Le R. Treleven; Oct. 27th. Flight-Sgt. W. Higson, from R.F.C.; Nov. 26th. Cdt. J. E. Brance, from R.F.C.; Nov. 28th. J. P. Young; Nov. 29th. T. Rivers-Fry, C. J. Aust. F. C. E. Burton; Dec. 3rd.

**Brigade Major.**—Lieut. (Temp. Capt.) W. L. Birch, W. York. R. (T.F.), from a Staff Officer, 3rd Cl. (graded as Staff Capt.), and to retain his temp. rank while so employed; Sept. 15th.

**Memorandum.**—Mr. Sgt. W. C. Ibbott from R.F.C. to be 2nd Lieut. or duty with R.F.C.; Nov. 23rd.

## Aeronautical Inspection Department.

London Gazette Supplement, December 19th.

Temp. Hon. Lieut. A. N. Barnett to be Temp. Hon. Capt. whilst employed as Inspector A.I.D. June 1st.



# Personals

## Casualties.

Captain THOMAS VICARS HUNTER, Rifle Brigade, attached R.F.C., who was killed on December 5th, aged 20, was the younger of two sons of Mr. H. C. V. and the Hon. Mrs. Hunter, of Abermarlais Park, Llangadock, Carmarthenshire, and Kilbourne Hall, Derby. He was educated at Ladycross (Mr. Roper's) and at Eton (Mr. C. H. K. Marten's house). He left Eton at the outbreak of war for Sandhurst, and received his commission in the Rifle Brigade in December, 1914. In January, 1915, he met with a severe accident, which resulted, after many months in hospital, in the loss of a leg. He worked for some time at the War Office, and was eventually passed fit for home service and rejoined his regiment in November, 1915. Early this year he joined the R.F.C., and went to the front in June as a pilot, being promoted flight commander in October. He was gazetted captain in the Rifle Brigade on December 14th.

Lieutenant CLAUDE WILLIAM MICHELIN NOSWORTHY, R.F.A., attached R.F.C., who it was recently stated died of wounds on December 6th, was the third son of Mr. and Mrs. Richard Nosworthy, of Jamaica. Born in 1895, he was educated at Exeter School and at McGill University, Montreal, where he was studying engineering at the outbreak of the war. He returned to England and obtained a commission in the R.F.A. in September, 1914. He received his promotion three months later, and, in November, 1915, became adjutant to his brigade, being, in October, 1916, gazetted to the Regular Army. He fought with distinction through the battles of Loos and the Somme, possessing the full confidence of his commanding officer, who reported most favourably on him. Last February he was attached to the R.H.A., and in September he joined the R.F.C. He received his fatal wound in aerial combat within one week after his return to the front.

Lieutenant RUSSELL WINNICOTT, M.C., R.F.C., who was killed in action on December 6th, aged 19, was the youngest

son of Richard W. and Annie Winnicott, Hyperion, Manna-mead, Plymouth.

## To be Married.

The engagement is announced between Captain GERALD ALLEN, Connaught Rangers (Major, R.F.C.), son of Mr. Robert Allen, of Coolgrene, Rushbrook, Co. Cork, and MINA, only daughter of Brigadier-General Sir Owen and Lady THOMAS, of Anglesey.

The marriage arranged between Captain P. E. L. GETHIN, R.F.C., and Miss NORAH STAPLEDON will take place very quietly on January 17th in Exeter, leave permitting.

The marriage between Second Lieutenant TREVLYN GREY, Australian Flying Corps, only son of Mrs. Grey, of Sydney, N.S.W., and KATHARINE, younger daughter of the vicar of Batheaston, Bath, and Mrs. DOWNES, will take place on January 2nd at Batheaston.

The engagement is announced of Captain W. W. HIGGIN, King's (Liverpool) Regiment, and R.F.C., only son of Mr. and Mrs. W. S. Higgin, Freshfield, Lancs., and Miss OLIVE EARLE, only daughter of Mr. and Mrs. A. B. Earle, The Old Hall, Puddington, Neston, Cheshire.

An engagement is announced between JOHN TREVOR KYFFIN, R.F.C., only son of Lieutenant-Colonel John Kyffin, R.A.M.C., of Penrhyn, Alverstoke, Hants, and MARGARET JOYCE DE WINTON WILLS, second daughter of Mr. and Mrs. Wills, Ramsbury Manor, Wiltshire.

## Items.

The will of 2nd Lieut. the Hon. FRANCIS WALTER STAFFORD McLAREN, R.F.C., M.P., for the Spalding Division since 1910, of Little College Street, Westminster, who met his death on August 13th while flying, younger son of Lord Aberconway, has left unsettled estate of £8,381.

## AIRCRAFT WORK AT THE FRONT.

### OFFICIAL INFORMATION.

#### British.

"During December 10th, several patrols were carried out by naval aircraft, in the course of which three of our machines attacked and drove back five enemy scouts and seven large seaplanes. Two enemy machines were also destroyed and two kite balloons attacked. Enemy trenches and an active anti-aircraft battery were attacked by machine-gun fire. At noon a bombing raid was carried out on Varsenaere aerodrome (south-west of Bruges), many bombs being dropped. Two direct hits are reported, and bombs were observed to drop close to and among sheds in aerodrome. All our machines have returned safely."

#### General Headquarters, December 11th.

"On the 10th instant the weather became suitable for flying, and great activity took place in the air on both sides. The enemy's machines were particularly active west of Cambrai, making repeated attacks on our artillery machines. Our aeroplanes dropped many bombs and fired many rounds from their machine-guns on the enemy's villages, hutments, and trenches. In the evening, hostile machines dropped bombs in our Army areas, but only slight damage resulted. During the day two German aeroplanes were brought down in air fighting, and two others were driven down out of control. A hostile balloon was also brought down and another German aeroplane was shot down by our infantry. Three of our aeroplanes are missing."

"At 11 o'clock on the 11th instant our machines left their aerodromes in fine weather to bomb certain factories in Germany. On reaching the area of their objectives, our pilots found their target obscured by clouds, but seeing a clear gap farther north-east they continued their flight in that direction. Through the gap in the clouds they recognised the large railway junction north-east of Pirmasels and dropped their bombs upon it. The closing of the gap in the clouds prevented observation of the results."

"Although the whole sky was covered by low clouds during the return journey all our pilots succeeded in reaching their aerodrome safely."

#### Admiralty, December 12th.

"During the night of December 10th-11th naval aircraft carried out a bombing raid on Ostender aerodrome and Bruges Docks. Many tons of bombs were dropped on both objectives. On the former, owing to poor visibility, results were difficult to observe, but at the latter good shooting was made and a fire started. All our machines returned safely."

#### War Office, December 12th.

"Salonica.—Our aeroplanes have twice bombed Rupel, causing damage to buildings and stores. On December 10th an enemy machine was brought down out of control near Nikolic (north of Lake Doiran)."

"Palestine.—Our aeroplanes bombed troops and transport about Bireh with good results."

#### Admiralty, December 13th.

"On the night of December 11th a bombing raid was made by naval aircraft on Bruges Docks. Visibility was bad, with low-lying clouds. One of our machines is missing. The usual fighter patrols were carried out; one enemy aircraft was driven down out of control and observed to crash."

#### General Headquarters, December 13th.

"On the 12th inst., in spite of low clouds and mist, a great many of our aeroplanes were in the air. The enemy's troops were engaged with machine-gun fire during their attack on our positions at Bullecourt, bombs were dropped,

and low reconnaissances carried out. There was much air fighting, in which a Gotha aeroplane and one other German machine were brought down, and three other hostile machines driven down out of control. Another hostile machine was shot down in our lines by anti-aircraft gun fire. All our aeroplanes returned."

#### General Headquarters, December 14th.

"On the 13th inst., one German aeroplane was shot down by our infantry. There is nothing further of special interest to report concerning aerial activity on either side."

#### War Office, December 15th.

"Palestine.—Since Wednesday three enemy aeroplanes have been destroyed and one has been driven down out of control."

#### General Headquarters, December 16th.

"Although the weather was fine on the 15th inst., a very high wind and ground mist interfered with reconnaissance and artillery work."

"During the day many rounds were fired from the air into the enemy's trenches and bombs were dropped by our aeroplanes on numerous targets, including two positions of long-range guns south-west of Lille. These gun positions were again bombed by us during the night."

"Enemy aircraft activity was considerable all day, and several fights took place. Three hostile machines were brought down, and two driven down out of control. None of our aeroplanes are missing."

#### War Office, December 16th.

"Palestine.—Our aeroplanes dropped 56 bombs on motor-boat sheds and on troops at the mouth of the Jordan with good effect, obtaining 24 hits."

#### War Office, December 18th.

"Palestine.—A hostile aeroplane has been driven down near Nablus. "It is interesting to note that in the bombing on boats, troops, and sheds at the north end of the Dead Sea our aeroplanes were flying 400 ft. below sea level."

#### General Headquarters, December 18th.

"On the 17th instant heavy snow prevented flying except on a small portion of the northern front. In this locality a certain amount of work was done by our aeroplanes, and bombs were dropped upon a hostile aerodrome near Courtrai. The enemy's trenches were also attacked with bombs and machine-gun fire. At night, Roulers station and aerodrome and Ledeghem and Menin stations were heavily bombed by us. In air fighting, two German machines were brought down in our lines and two others were driven down out of control. One of our machines is missing."

#### French.

"Between December 10th and December 13th nine German machines were brought down by our pilots. During the same period our bombing aeroplanes carried out various operations; 10,000 kilogrammes of explosives were dropped, notably on the aerodromes of Colmar and Schlestadt, the depot of Logelbach, the factories of Rombach, the region of Wavrille, Chambley and Thiaucourt, and the railway stations of Warmeriville, Lunville, Amagne, and Lucquy. Effective results were observed."

"Yesterday (December 12th) enemy aeroplanes flew over Dunkirk and dropped bombs, but there were no casualties."



Paris, December 16th.

"Our chaser aeroplanes were active yesterday. Five enemy machines were brought down by our pilots. It is confirmed that three other German machines crashed to the ground in the course of engagements fought on December 13th and 14th."

"Salonica.—About 30 Allied aeroplanes bombarded the depôts and the station of Cestovo. An enemy aeroplane was brought down by our anti-aircraft guns."

Italian.

Rome, December 11th.

"Two enemy aeroplanes were brought down during air fighting; one fell at Noventi di Piave and the other, for which our Allies' airmen accounted, near the Ponte della Priula."

Rome, December 12th.

"Two enemy machines were brought down by British airmen."

Rome, December 14th.

"Three enemy machines brought down by our airmen fell in Val d'Assa, north of Asiago, and north of Mt. Grappa; a fourth machine was brought down by artillery fire in the vicinity of Susegana."

Rome, December 16th.

"On the night of the 14th-15th inst. movements of troops in the enemy's lines of communication were effectively bombarded by our airships."

"A hostile aeroplane was brought down by a British airman near Ormelle, and one of our own airmen accounted for another machine to the west of Sereen Valley."

Rome, December 17th.

"On the whole of the front the aerial activity was marked on both sides. In the zone to the north of Mont Grappa one of our Caproni squadrons and reconnoitring machines bombed and attacked with machine-guns on several occasions enemy infantry which had assembled at this point."

German.

Berlin, December 11th.

"Following strong reinforcements of the flying forces violent aerial combats took place, especially on the French front. The enemy lost 11 aeroplanes and one captive balloon."

Berlin, December 12th.

"In November, the losses of the enemy's aerial forces on the German fronts amounted to 22 captive balloons and 205 aeroplanes, 85 of which fell behind our lines. The rest were seen to fall on the other side of the enemy's positions. We have lost in battle 60 aeroplanes and two captive balloons."

Turkish.

Constantinople, December 11th.

"Bombs have again been dropped on Imbros. All our machines returned safely."

## THE LAZILITE FOR

WHEN draughtsmen are as scarce as they are at present it is of the utmost importance that those who are available should be given the means to enable them to work efficiently, and, as those who have any experience of drawing office work know, one of the primary considerations is proper lighting. At this time of the year, when so much work has to be done by the aid of artificial light, the difficulties of the problem are emphasised because of the necessity for adjusting the illumination in order that the draughtsman may not be hampered by the shadows. Electric light lends itself to adjustment to varying positions, because of the flexibility of the cables, but when working on a drawing it is often desirable to shift the light from one place to another, just a short distance, in order to avoid shadows. With the temporary expedients which are often deemed sufficient that not only entails a certain amount of lost time, but there is a break in the continuity of the work, which provides an opportunity for errors to creep in.

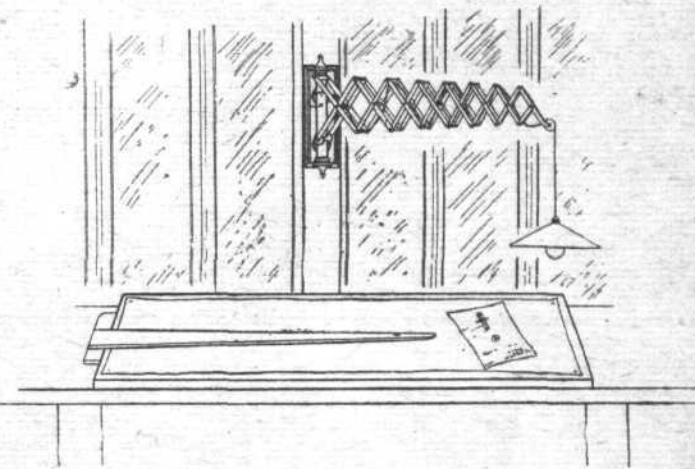
There are, therefore, strong claims for the Lazilite fitting which is shown in our sketch. It is a simple arrangement—an adaption of the "lazy-tongs" principle—but is so made and balanced that the slightest touch is all that is necessary to open or close it, while it will "stay put" at any intermediate position. The arm is mounted on a wall fitting, and has a hinge joint which allows it to be swung from side to side. The combination of the two movements permits of the light, which is suspended from the end of the arm, being shifted to any position over the drawing board. Where it is desirable to vary the height of the light the ordinary counter-balance can be used so that with the Lazilite the illumination is instantly adjustable in three dimensions.

The advantages of this infinite range of movement are so obvious that it is unnecessary to dwell upon them, except, perhaps, to point out that, although attention has been specially drawn to the value of the Lazilite for drawing office work, its use is by no means confined to that. We under-

## DRAWING OFFICES.

stand, as a matter of fact, that it has been adopted in several machine shops with very good results.

The cost of the installation is not really a very serious item, especially when the economy and increased efficiency is borne in mind. The use of the Lazilite will often mean that one lamp will suffice where, with fixed lights, it would be necessary to have two or three in use in order to secure the requisite illumination. The fitting is well-made, and is



practically indestructible, its extreme flexibility enabling it to stand a great deal of hard and rough use with impunity.

An adaption of the Lazilite fitting is made to carry a telephone. This can be supplied either for screwing to the table, or for attachment to the wall. In either case it permits of the telephone being out of the way until it is required, when a touch adjusts it to a convenient position for speaking; when it is finished with, another slight touch sends it back.

## A WIDENING INDUSTRY.

BEFORE the war there was one department of the aviation and motor industry on which—apart altogether from the notorious example of the magneto—we were dependent mainly for our supplies on foreign and principally enemy sources. We refer to balls and ball bearings, which play so important a part in the constructional part of both industries. True, there was at least one large firm, to say nothing of smaller concerns, engaged upon the manufacture in England of these essentials, but even so the home production of balls and of finished ball bearings fell very far short of the total imports from Germany and America, while in the total of imported balls and bearings Germany easily led the way.

One day last week we were privileged to visit a certain works in a certain town in the Eastern Midlands—we dare not be more precise in naming localities, with the penalties of "Dora" hanging over our heads—and the main result of that visit was the conviction that the day of Germany as our source of supply in this direction is past and done with for all time. The name of the firm concerned—we do not think we come within the provisions of Orders and Regulations in giving it—is the Ransome and Marle Bearing Co., and the story of its entry into this branch of the business is almost a romance. Originally, the parent concern was engaged, and is now engaged, in the making of wood-working machinery, in which a certain number of ball bearings are used. At one time the firm bought these bearings complete. Then it bought the balls and made them up into bearings for

itself. Next certain patents were taken out and acquired, covering certain types of bearings. From that it was only a step to supplying other people, and one of the things that surprised us during our visit was the knowledge imparted that more than one famous English car has used these bearings for a considerable time.

Like most other firms engaged in similar trades, the war brought the Ransome and Marle Co. a great deal of Government work, mainly in connection with aeroplane engine bearings. One result of this influx of work is that really enormous extensions of the works have had to be undertaken and are now nearly completed. A new ball-making plant is being installed, and when this is completed and working the company will be absolutely self-contained and independent. More than that, it is evidently going to be a very large producer of its specialities, and the directors look forward to the time when, as soon as peace reigns again, they will not only be able to supply all the needs of home manufacturers, but will be able to meet and beat foreign competition in the overseas markets of the world. Needless to say, we can describe nothing that we saw on our visit, but this we may put on record; that we are fully satisfied of the ability of the firm to carry out its full programme. Which is excellent, as indicating that British enterprise is ready, awake, and willing to take advantage of the openings developing as a consequence of the war and the misdoings of the arch-enemy of civilisation who aforesaid was our most formidable industrial rival in the world's markets.



## UNAFFILIATED MODEL CLUBS DIARY AND REPORTS.

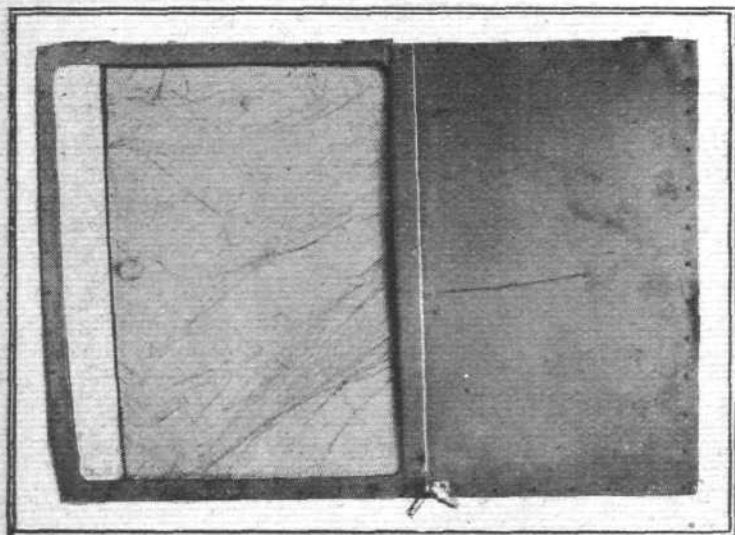
Club reports of chief work done are published monthly. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

**Finsbury Park and District** (30, HANLEY ROAD, HORNSEY ROAD, N.; Flying ground, Parliament Hill.)

Mr. A. E. Jones of New Oxford Street has kindly offered some prizes to be competed for in an open event under the following rules:—1. Competition to be held at the club's ground, weather permitting, and for duration only. 2. Entrance fee, 6d., to be paid on the ground before competition. 3. Tractors only, biplanes or monoplanes. 4. Loading not less than 3 ozs. to square foot, counting main planes only. 5. One event for under 16 years and one for over 16 years. 6. One rise off ground and two hand-launched, time permitting. 7. All competitors must be ready to start at 3 o'clock, otherwise disqualified. 8. Competitions will not be held unless there are more than three entries.

**Monthly Report.**—The weather has not been ideal for flying during the month, but some records have been made. Three of the members have turned their attention to biplanes. On the 17th, four members were out. Mr. Coleman was trying a new biplane, and made some fine flights of 30 seconds. A smart monoplane was brought out by Mr. Colebatch, making high flights with a duration of 40 seconds. Mr. Richards was trying his hand with a speed machine. This in flight is very similar to Mr. Burchell's, climbing high and putting up some good durations, although it seemed unable to resist the temptation to land in the allotments. Mr. Burchell was flying one of his usual machines, which seemed to shoot up like a rocket, due largely to a specially design tractor screw. After tea three of the members took advantage of the moonlight to do some more flying and good flights were made. Some of the members were out again on the 18th. Mr. Colebatch had a biplane out which showed promising results, and making some steady flights. A biplane was flown by Mr. Coleman, which had been slightly altered from the last one, and showed great improvement in flying, making a flight of 55 seconds, timed by some of the members. Mr. Coleman hopes to give a description and photo. of this model at a later date. Mr. Richards was flying a little monoplane with good results.

On December 8th, there were three biplanes out. Mr. Coleman's machine making the best flights of the afternoon. Mr. Colebatch's model made one or two good flights, but suffered from a two small tractor screw. The model flown by Mr. Richards showed promising results, and after a few alterations are made, should make a good flyer. Mr. Burchell was flying a very neat monoplane, but did not make such good flights as were expected owing to wing trouble. Mr. Rayner has paid the club one or two visits, during the month. Mr. A. E. Jones has become a member of the Club.



A good example of Triplex safety glass in flying.—Beyond the radiating decorative star effect on the glass, not a particle of the glass in this window, fitted to a "Sage" flying machine, was damaged or came away, although a tree was struck at 30 feet from the ground by the machine at a speed of 90 m.p.h. The screen was lent for inspection by Mr. Gordon England, Manager for Messrs. Sage and Co., Peterborough.

### Burberrys' 1918 Sale.

THIS annual opportunity for saving money and replenishing an exhausted wardrobe, which lasts from January 1st to February 28th, is especially welcome in the fourth year of rapidly diminishing supply of essential dress commodities and increased demand for economy in the allocation of private expenditure. According to a recent technical report, woven woollen materials, so vital to comfort in this climate, will be scarcely procurable in the coming year, as not 10 per cent. of the cloth required will be available, and what there is will reach an almost prohibitive price.

The sale stock includes every sort of tailored garment that either sex requires for out-door purposes from the beginning to the end of the year, and, in spite of the acute shortage in labour and material referred to, it promises to excel, in variety and quality of the bargains offered, any of the firm's previous enterprises of the same nature.

Two illustrated catalogues of the sale are published—one for ladies and the other for men—with measure forms and full particulars as to prices. Either or both will be sent post-free on application to Burberrys, Haymarket, London, S.W. 1.

## NEW COMPANIES REGISTERED.

**BALFINER, LTD.**, 32, Charing Cross, S.W. 1.—Capital £1,500, in £1 shares. Manufacturers of and dealers in aeroplanes, airships, &c. First directors: H. N. Ballantyne and M. L. Finch.

**INGATE ENGINEERING COMPANY, LTD.** (149,038).—Private company. Registered, December 3rd. Capital £2,000, in £1 shares. Manufacturers, designers and repairers of and dealers in internal-combustion engines, aircraft, aeronautical apparatus, hydroplanes, ships, launches, boats, vehicles, &c. The subscribers (each with one share) are:—C. H. King, 24, Budge Row, E.C.4, solicitors' managing clerk; A. W. Gardiner, 6, Tugela Street, Catford, S.E., clerk. The first directors are to be appointed by the subscribers. Solicitors: Best and Best, 24, Budge Row, E.C.

**NOTTINGHAM FLYING AND CORRESPONDENCE SCHOOLS, LTD.**, 44, Parliament Street, Nottingham.—Capital £20,000, in £1 shares. Acquiring an invention relating to sparking plugs, and under agreement with W. H. Pease to carry on a flying school. First directors: W. H. Pease and F. Parvin.

**PLYWOOD ASSOCIATES, LTD.**—Capital £5,000, in £1 shares. Manufacturers of and dealers in plywood and aircraft parts and fittings, engineers, &c. First directors:—C. E. Lyon, H. V. Shepperd and C. T. Cripps and L. G. Lyon.

## BUSINESS NAMES REGISTRATIONS.

**BLENHEIM ENGINEERING CO.**—Registered November 10th, 1917. Dealers in aircraft fittings. Blenheim Works, Blenheim Street, King's Road, Chelsea, S.W.3. Business commenced, October 13th, 1917. Partners: (1) J. A. Wilkinson (British), 35, Osborne Road, N. 4. (2) D. N. Portsmouth (British), 34, Longmead Road, Tooting, S.W.

**CONSTRUCTOR TYRE COMPANY.**—Registered November 14th, 1917. Bicycle and aeroplane tyre manufacturers, 13, Nursery Lane, Forest Gate, E. Proprietor: Leon Meredith (British), 44, Leith Mansions, Elgin Avenue, Maida Vale. Business commenced, 1909.

## PUBLICATIONS RECEIVED.

*The High-Tension Magneto.* By A. P. Young, A.M.I.E.E., A.I.E.E. Aeronautical Reprints, No. 4. London: The Aeronautical Society, 7, Albemarle Street, W. Price 5s.

*Notes on Screw Gauges, by the Staff of the Gauge Testing Department.* Teddington: The National Physical Laboratory.

*"A.A.C."* The Journal of the R.N. Anti-Aircraft Corps. No. 5 (Christmas Number). London: The Anti-Aircraft Corps, 4, Whitehall Gardens, S.W.1. Price 6d.

*The Work and Training of the Royal Naval Air Service.* London: The Illustrated London News, 172, Strand, W.C.2. Price, 2s. 6d. net.

*Desk Calendar and Mirror, 1918.* Messrs. Cellon, Ltd., Broad Street House, New Bond Street, E.C.

*Text-Book of Inorganic Chemistry.* Volume IV. Aluminium and Its Congeners. By H. F. V. Little, B.Sc., London: Charles Griffin and Co., Ltd., Price, 15s. net.

*The Organiser.* November, 1917. London: The Trade Organiser Co., Regent House, Kingsway, W.C.2. Price 3d.

## Aeronautical Patents Published.

Applied for in 1916.

The numbers in brackets are those under which the Specifications will be printed and abridged, &c.

Published December 27th, 1917.]

13,480. E. R. CALTHROP. Parachutes. (111,498.)  
18,123. F. H. CLIFT. Pressure gauges for instruments indicating wind velocity. (111,565.)

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